MINISTRY FOR DEVELOPMENT OF INFORMATION
TECHNOLOGIES AND COMMUNICATION OF THE REPUBLIC OF
UZBEKISTAN

TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES

FINAL QUALIFYING WORK

on subject:

DEVELOPMENT OF ELECTRONIC PRACTICAL COURSE FOR DISCIPLINE
«TECHNOLOGY OF CREATING MULTIMEDIA PRODUCTSINADOBE
FLASH»WITH USINGTHE ARTICULATE STORYLINE PROGRAM

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Tashkent 2016

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TASK
for final qualifying work of
Nuserova Firyuza Muratovna

</div>

on subject:"Development of electronic practical course for discipline «Technology of creating multimedia productsinAdobe Flash»with usingthe Articulate Storyline program"
1. The subject was claimed with order of university «15».12.2015 № 1324-20
2. The deadline of delivery finished work 25.05.2016
3.Raw data for work lecture, books, methodical applications, articles, web-sites, multimedia applications
4.The content of settlement and explanatory notes (list of the subjects, which are to be developed), abstract, introduction, Chapter 1, Chapter 2, Chapter 3, conclusion, list of references, the application
5. The list of graphics drawings, diagrams, tables, screenshots.
6. The date of issue the task 23.12.2015

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Consultant _____
signature

Task taken _____
signature

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7.Consultants of separated sections of the final qualification work

Name of the part	Consultant	Signature, the date of issue	
		Task given	Task received
Main part	AkhatovaR.Yu.	24.12.2015	24.12.2015
Safety of life	AmurovaN.Yu.	02.02.2016	02.02.2016

8.Graph of the performing the work

№	Name of the part	Executiondate	The signature of consultant
1.	Introduction	24.12.2015	
2.	Theoretical bases of development of electronic practical course	30.01.2016	
3.	Development of electronic practical course with using the articulate storyline program	08.04.2016	
4.	Life safety of activity and ecology	15.05.2016	
5.	Preparation presentation	17.05.2016	
6.	Report	19.05.2016	
7.	Provisional protection	20.05.2016	
8.	Protection	31.05.2016	

Graduate   Nuserova F.M. «____»_____ 2016 y._____

Consultant Akhatova R.Yu. «____»_____ 2016 y. _____

* * *

This final qualification work is devoted to development of electronic practical course for discipline «Technology of creating multimedia productsinAdobe Flash» with using Articulate Storyline program. Given modern requirements for electronic tutorials, and the steps of creating a course of practical training. Special attention is paid to the application of the e-learning course based on the Articulate Storyline program. The practical significance of the developed course in the teaching process is the facilitation of perception of learning material and improving the quality of teaching. Also the issues of life safety are considered.

* * *

Ushbu malakaviy bitiruvishi Articulate Storyline dasturi yordamida "O'quv multimediyali ilovalarni Adobe Flash dasturida yaratish texnologiyasi "fani bo'yicha amaliy mashg'ulotlar elektron kursiga bag'ishlangan". Shuningdek, elektron o'quv qo'llanmalar va o'quv amaliy mashg'ulotlarni shakllantirish bosqichlari zamonaviy talblarga mos holda ishlab chiqilgan. Binobarin, alohida e'tibor elektron kurslarning Articulate Storyline dasturi asosida qo'llanilishiga qaratilgan. Shu bilan bir qatorda ishlab chiqilgan kursning o'quv jarayonidagi amaliy ahamiyati shundan iboratku, unda tinglovchilarning yetkazilayotgan ma'iumotlarni oson va soddalashtirilgan holda qabul qilishlariga hamda o'quv sifatint seziarli darajada oshirilishiga yo'naltirilgan. Bundan tashqari, xavfsizligini ko'ring.

* * *

Данная выпускная квалификационная работа посвящена созданию электронного курса практических занятий по дисциплине «Технология создания учебных мультимедийных приложений в программе Adobe Flash» при помощи программы Articulate Storyline. Приведены современные требования к электронным учебным пособиям и этапы создания курса практических занятий. Особое внимание уделено применению электронного курса на основепрограммы Articulate Storyline. Практическая значимость разработанного курса в учебном процессе заключается в облегчении восприятия преподаваемого материала и повышении качества обучения.Также рассмотрены вопросы безопасности жизнедеятельности.

CONTENT

Introduction

"Today we adequately respond to urgent requirements and challenges of a rapidly changing time, the era of globalization, the Internet age, penetraring deeper into our lives, ensuring the development and progress of the country, setting himself such a lofty goal as the creation of the state with great future"

I. A. Karimov

Uzbekistan after independence chose its own development path – the path of large-scale reforms aimed at building a democratic state, a socially oriented market economy and strong civil society. As emphasized by our President I. A. Karimov, the achievement of the noble goals of the people of Uzbekistan, the future of the country, her prosperity and welfare, then, what place it will occupy in the world community in the XXI century, - all this depends primarily on the new generation, what our children will grow up."...in our country the first steps towards independence attaches great importance to the revival and further development of our great spirituality, to improve the system of national education, to raise them to the level of world standards in harmony with the demands of the time.

These wise words vividly reflect the essence of being implemented in Uzbekistan in the years of independence the state policy, the main priority of which was taking care of the education of harmoniously developed generation – physically healthy and spiritually Mature, intellectually rich, possessing not only diversified knowledge, but also able to think independently, to face the future. Widely apply advanced pedagogical technologies and interactive methods of learning. Each school has its own information resource center, possessing a large Fund of educational literature, including in electronic media. All this creates conditions for producing high-quality, deep, versatile knowledge. President of Uzbekistan Islam Karimov on March 21, 2012 signed a Resolution "On measures on further introduction and development of modern information and

communication technologies" which aims to introduce and develop ICT in different sectors, especially in education [2].

Education must stay ahead of life. How education can get ahead of life? It is clear that to teach that which is not yet impossible. But to give the student advanced knowledge, at the same time orienting it to the solution of fundamental, conceptual issues - you can. It is the conceptualization of education in the field of specific implementations stimulates the search for new, better, more courageous decisions.

The relevance of the work. Development of e-learning course is currently a topical area in the development of information technology designed to help the teacher and student in the educational process.

Computerization is an objective process in all spheres of human activity, including education. The goal of Informatization of education is the global intensification of intellectual activity through the use of new information technologies [1].

Information saturation of contemporary society, its functionality at a decent level today assume such a speed of movement of information, which can provide only a computer network, integrated into the global information space.

The aim of the work is to develop electronic course of practical lessons on discipline "Technology of creation of educational multimedia applications in Adobe Flash".

To achieve the objective of the thesis the following **goals** were set:

1. To perform a special, pedagogical, psychological literature to identify the characteristics of design of electronic training course.

2. To consider and determine the stages of designing and creating ETC.

3. To develop the content of the e-learning course, fully containing the necessary and sufficient material on the subject "Technology of creating multimedia productsinAdobe Flash".

The object of research is process of teaching the discipline "Technology of creating multimedia productsinAdobe Flash".

The subject of research - the study of modern technical means of education using information technologies.

Practical significance. The e-course is designed to fully reflect practical works material and can be used for practical classes and independent work.

The structure of the work. The graduation thesis consists of 74 pages, including an abstract, an introduction, three chapters, list of references, tables, screenshots.

Chapter 1. THEORETICAL BASES OF DEVELOPMENT E-COURSE PRACTICAL EXERCISES

1.1 Theoretical information about the course practical classes

Development of e-learning course is currently a topical area in the development of information technology designed to help the teacher and student in the educational process [3].

On the basis of the guideline that "the full development of the person of our age can not be performed outside of the formation of cognitive interests and the relevance of the problem of teaching new information technologies in modern education, and the introduction of e-learning course.

Thus, in the information field in higher education formed a contradiction between the ever-widening scope of e-learning materials as learning tools at the University and identified the lack of specificity of such material the use of which provides the intensification of the educational-cognitive activity of students.

We introduce the concept of electronic training courses (ETC). E-learning course is a training program system of the complex purpose, providing continuity and completeness of the didactic cycle of the learning process: providing theoretical material, which provides training training activities and monitoring the level of knowledge, this program and methodical complex, providing the opportunity or with the help of a teacher to develop a training course or a large section with the help of computer.

E-learning course and software package with educational materials and tests on a particular subject.

Nowadays education system, the stage can be compared with the era that followed the emergence of the printing press. As you know, this has led to the abandonment of the system in which the teacher literally read his lectures, and students recorded them word for word and then memorized. Created by Czech teacher and humanist Jan Amos Comenius class - lesson system and was a response to a new situation. Under this system, students receive copies of

textbooks, which they can do in class and at home. Similarly, now a revolutionary change in the current learning technology in the education system designed to perform computing. Computers must inevitably lead to a change in current teaching technologies in schools, colleges and Universities, the introduction of computers in all spheres of human activities – the revaluation of certain knowledge. The main purpose of computers in education is the number of tasks directly related to information accumulation, the search processing), the introduction of ETC, allowing students to acquire the knowledge they need. Many data, knowledge of which is now considered essential for a professionally trained person, can, if necessary, to obtain on the monitor screen.

There are seven main technological stages of the design and creation of the ETC:

1. the analytical phase includes development of the overall design of ETC, the building information model of the studied discipline (section of disciplines, topics), the formulation of the basic instructional tasks and learning goals, a preliminary determination of the total substantive content of the course;

2. strategic phase containing the definition of the "image" of the contingent of students, development the most important task of the textbook, the choice of defining the strategic lines of teaching (choice of penetrating and/or basic pedagogical technologies, methods and tools);

3. training stage, closely related to the previous and including the development of the composition and the General plan build ETC;

4. technological-structural stage, consisting in an immediate realization of the plan in the form of a software product, debug and corrective refinements;

5. the implementation phase, involving the testing of the finished software product;

6. control and diagnostic phase, the results of which can be done not only a conclusion about the quality of a software product, but to provide an overall assessment of ETC from the standpoint of its conformity with functional requirements;

7. prognostic stage, providing feedback analysis of user – authors", improving the ETC taking into account the comments and wishes of users, the transfer of a new vision of the problems of establishing EC on the solution of the following didactic tasks.

According to this approach, features of design, both the content and educational technologies ETC are that:

1. used method of structuring the subject area, resulting in the training material is divided into a holistic, logically complete blocks;

• 2. it outlines the main content areas of educational action for the development of the material ETC for the organization of training activities on the oriented basis;

3. constructed of a single (but distributed throughout the volume ETC thesaurus of subject area;

• 4. compiled methodically conjugated with the contents of the system of practical tasks, which are then incorporated into various innovative technologies, transformed into an interactive version.

Consider the different classification of the stages of the design ETC.

In the design of ETC we can distinguish the following main activities: problem identification, conceptualization, formalization, implementation and testing.[4]

Identification includes determining the roles of stakeholders, characteristics of tasks, objectives and resources used. At this stage the composition of the working group, if necessary to decide the issues of additional training for teachers in the field of information technology, to programmers — on the questions connected
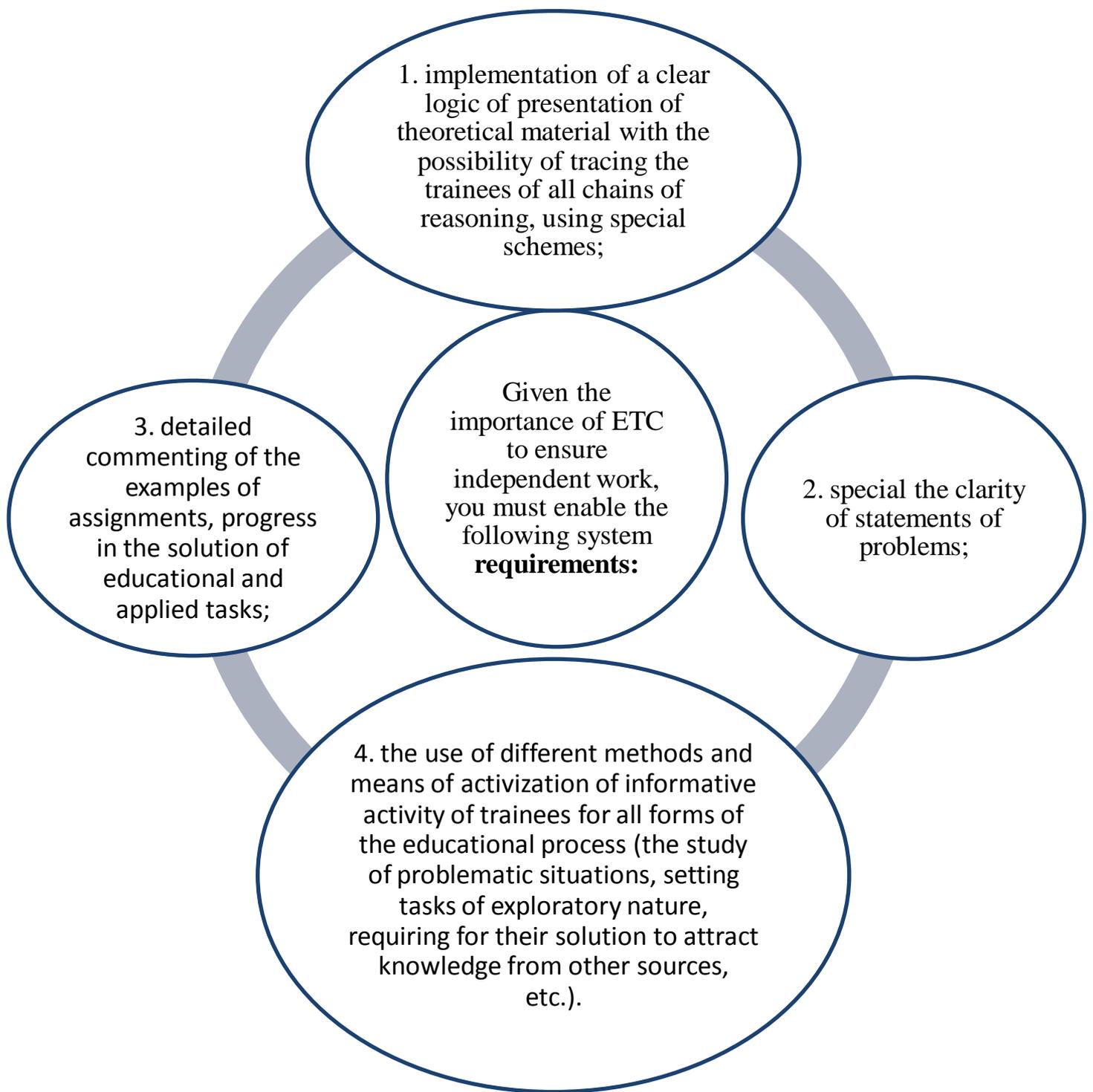
with the peculiarities of the presentation of didactic materials specific to the subject area.

Conceptualization involves determining the content, objectives and tasks of the discipline that captures the conceptual framework knowledge base. The teacher determines what kinds of information will be presented in ETC (texts, graphics, animation, audio and video files) which relationships should be established between them. For example, what sound is most preferably when the verification of knowledge, and what materials should be presented in the form of static graphics with text commentary, and animations, etc.

Formalization involves the analysis of didactic problems that must be addressed by the use ofETC, search and formalization of possible methods of their solution based on the model of the learning process and characteristics of the available data and technologies underlying the ETC. At this stage, we study possible scenarios for the trainees presentation of didactic material, the principles of assessment and feedback, and then build algorithms, which will be the interaction between trainees with ETC [5].

The project involves the translation of formalized methods for the solution of didactic tasks in the final scheme of the action script ETC — as automated training system, which defines features selected to implement information technology. During the testing phase the trainees are offered the following tasks, which are most likely tested the performance of ETC and will identify its possible weaknesses. The most important test scenarios inherent in the ETC, proving or refuting the effectiveness of different training methods. Very promising seem the contests of lesson development, focused on the use in class of electronic textbooks.

Given the importance of ETC to ensure independent work, you must enable the following system requirements:

1. implementation of a clear logic of presentation of theoretical material with the possibility of tracing the trainees of all chains of reasoning, using special schemes;

Given the importance of ETC to ensure independent work, you must enable the following system **requirements:**

3. detailed commenting of the examples of assignments, progress in the solution of educational and applied tasks;

2. special the clarity of statements of problems;

4. the use of different methods and means of activization of informative activity of trainees for all forms of the educational process (the study of problematic situations, setting tasks of exploratory nature, requiring for their solution to attract knowledge from other sources, etc.).
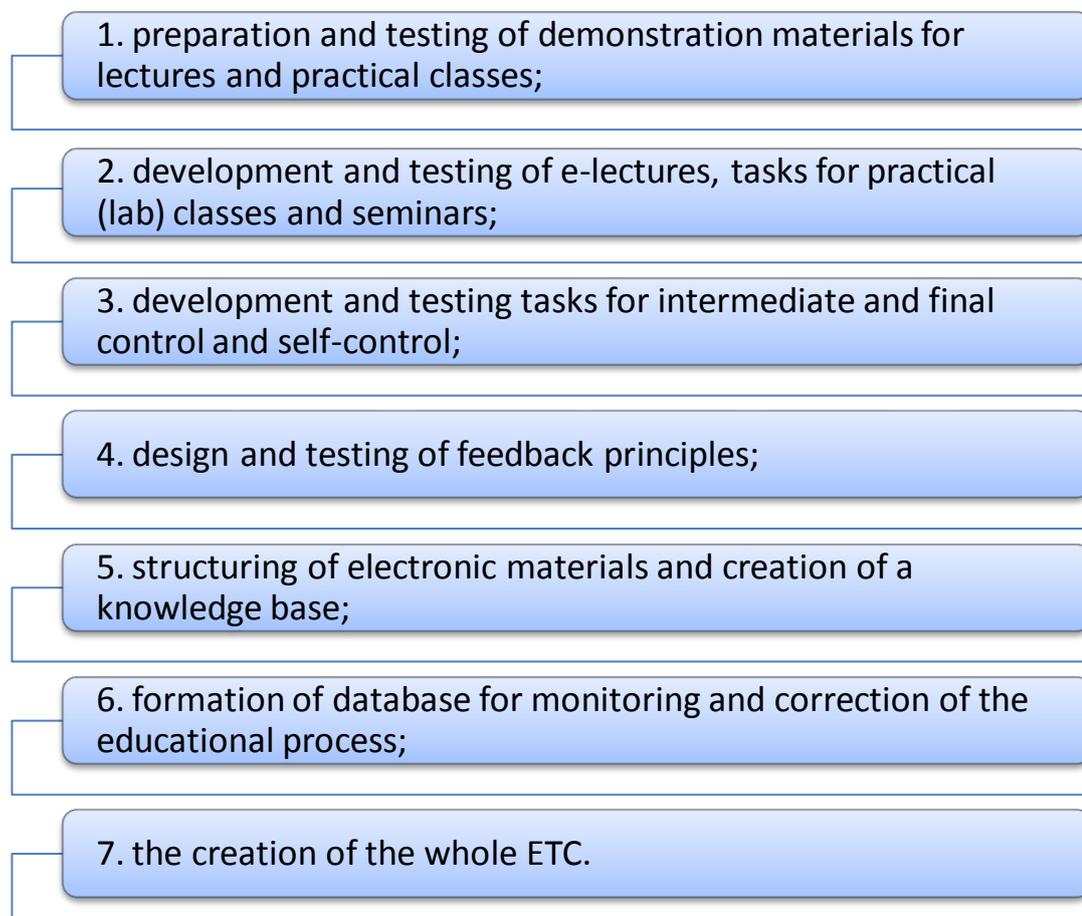
When designing the ETC must be considered: learning and development are interrelated processes, and training may be developmental only under condition of performance of requirements of the relevant psychological and pedagogical principles and regularities. In this connection it is necessary to use various methods and means of activization of informative activity of trainees at all levels of the educational process: to generate a problem situation, to offer comparison and logical nature, to put cognitive tasks, requiring for their solution to attract knowledge from other sources, etc [6].

The technology of preparation of the ETC you can lay one of the possible alternative approaches: bottom-up or top-down.

A bottom-up approach suggests a gradual building of ETC on the basis of a phased implementation in the educational process of e-learning materials of various kinds, which in practice is most accessible to the teacher.

In this case, the process of creating ETC can be characterized this sequence of stages:

1. preparation and testing of demonstration materials for lectures and practical classes;

2. development and testing of e-lectures, tasks for practical (lab) classes and seminars;

3. development and testing tasks for intermediate and final control and self-control;

4. design and testing of feedback principles;

5. structuring of electronic materials and creation of a knowledge base;

6. formation of database for monitoring and correction of the educational process;

7. the creation of the whole ETC.

The top-down design involves a very thorough pre-conceptual and technological elaboration of the generated product, taking into account all anticipated uses and features of integration into the educational process. Here are the main stages of the design ETC in this approach:

1. determine specific learning goals (knowledge, skills), educating and developing goals based on those additional opportunities offered by the use of EUK;

2. the formation of the content of the discipline, which can be extended in the case of using ETC;

3. programme details for themes or modules, the choice of teaching methods

4. design modules and scenarios ETC;

5. the decision of questions on creation and maintenance of a database for monitoring and management of the learning process on the basis of the ETC (if you are using network technologies);
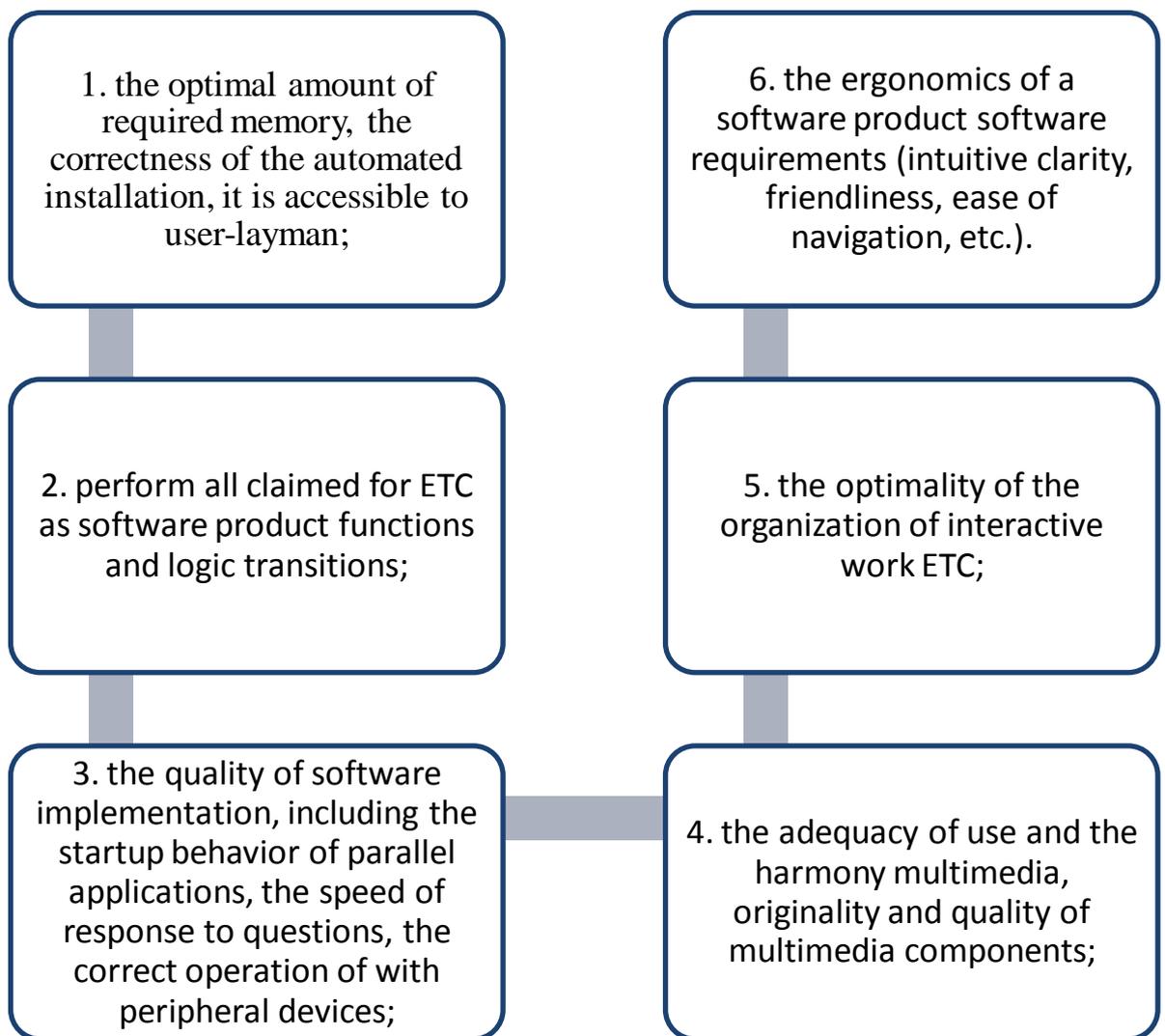
6. testing of the ETC.

Considered approach is especially characteristic in the development of ETC on the basis of special software. For example, for universities of the University of Europe and Central Asia, organized seminars, where interested teachers become familiar with the functions and features of the system and study design of ETC. Further interested itself forms the ETC on the basis of available materials: texts of lectures, plans of seminars, practical exercises, simulation programs etc. In this formal work can be entrusted to the engineering staff or the trainees themselves.

This set and the formatting of texts of lectures and tests, as well as their introduction into the ETC in accordance with the developed structure author [7].

The main effort of the teacher are directed to the preparation of scenarios where, in fact, find a way more methodical groundwork. Important role here plays the creative approach of the teacher to develop plans for seminars for different categories of trainees. ETC represents the learning materials that are structured in a special way and recorded on electronic carriers or available via a computer network (local or Internet). With this implemented in them flexible script able to adapt to the needs and opportunities of specific student and to develop his potential ability.

For effective use of ETC in the educational process is important not only its content, but also technical parameters — performance, ergonomic and artistic features. Basic requirements for this are as follows:

1. the optimal amount of required memory, the correctness of the automated installation, it is accessible to user-layman;	6. the ergonomics of a software product software requirements (intuitive clarity, friendliness, ease of navigation, etc.).
2. perform all claimed for ETC as software product functions and logic transitions;	5. the optimality of the organization of interactive work ETC;
3. the quality of software implementation, including the startup behavior of parallel applications, the speed of response to questions, the correct operation of with peripheral devices;	4. the adequacy of use and the harmony multimedia, originality and quality of multimedia components;

In the development of ETC necessary to take into account traditional and modern didactic principles. To traditional are:

The principle of scientific training. This principle requires that the content of the training material, selected to create ETC corresponded to a modern level of development of science and technology. E-learning course promotes independent students acquiring new knowledge [8].

The principle of accessibility of education. From this principle suggests that training should be accessible and affordable to the age, abilities and level of development of students. "All be studied, should be distributed according to the steps of the age."

On the basis of this principle is determined by the degree of difficulty of educational material, its volume. At the same time, the principle of accessibility is at the basis of the General psychological and individual peculiarities of students,

depending on their age, level of development, the subject of study and other factors. Upon presentation impossible to understand the teaching material is sharply reduced motivational attitude to teaching, decreases efficiency, decreases the effort. However, excessive simplification of the material is not conducive to the formation of skills and most importantly does not contribute to the development of the student.

Hence, starting the selection of the material for the electronic manual, you need to know the characteristics of those students for whom the program is compiled. At the same time it should be noted that a software tool may not be optimal for all people at the same time.

The principle of systematicity and consistency. When building a multimedia textbook must comply with the principle of consistency of presentation. Comenius believed that education should take place "gradually and no jumps".

This principle implies the consideration of any fragment of educational material in a multimedia tutorial in connection with other fragments in a logical sequence. Therefore, when the educational material and in the preparation of the pedagogical scenario of the program we took into account the logical validity of the sections and topics of the textbook.

The principle of consciousness, activity and independence of students in learning. This principle consists in mastering by students when using multimedia teaching AIDS with the knowledge, skills and abilities based on activity and independence of their actions, manifestations of interest, passion and desire to develop creative skills.

The most important requirement of multimedia tutorial based on this principle, is that the matching algorithms, in accordance with which the program will build the activities of the learner in mastering the material, care should be taken to the positive motivation of learning. "In whom there is no desire for learning, will be taught in vain if you're in it in the first place will not excite the desire for learning".

Formulation and maintaining the motivation of the student are necessary for learning efficiency.[9]

The principle of clarity. For the first time theoretical justification of the principle of visual learning introduced Comenius and later was developed by I. G. Pestalozzi, K. D. Ushinsky and other teachers. It is the principle of clarity, according to Comenius, is "the Golden rule of didactics", which reads as follows: "... All that is possible, to provide for the perception of the senses, namely: a visible – for the perception of vision, hear – hearing, smell – sense of smell, is subject to taste – taste, available touch by touch". It is, accordingly, required to engage in the process of perception by students of the new material as many of the senses. Comenius believed that the visibility becomes a crucial factor of learning.

K. D. Ushinsky was given to the psychological basis of visual learning. Visual AIDS are a means to enhance mental activity and the formation of the sensitive image. It sensitive way, and not the visual aid is mostly in the training.

It is obvious that with the advent of computers, learning has become more evident. Imagery, brightness, dynamic illustrations, which are implemented using the multimedia capabilities of the computer for realizing the most complex phenomena and processes, all of this greatly expand the possibilities of visual AIDS in the educational process. With the help of computer graphics programs to create posters, diagrams, pictures, drawings, videos, slides and other technical documentation. It helps students in difficult-to-understand snippets of educational material that require visual explanations improve perception, understanding and assimilation, reduce training time, increase the efficiency of training activities in General [10].

Do not overload the imaginative and emotional memory of students. In the electronic manual, you need to enter only what is absolutely necessary to achieve identified learning goals. At the same time, in the process of creating a multimedia textbook should make maximum use of the capabilities of computer graphics to implement visual AIDS in training.

New didactic principles

The principle of interactive learning means that learning process should take place the interaction of the student with the electronic tutorial. In relation to the electronic textbook interactivity should be considered as a principle of construction programs and as a criterion of its quality. The interaction involves the presence of feedback: the manual should extradite training effect (an explanation, a clue, a new question, a new job, etc.) only after the analysis of the actions of the student.

The principle of adaptive learning using e-textbooks means adaptation, adaptation of learning process to the level of knowledge, skills, psychological characteristics of the student.

Electronic manual allows you to vary the depth and complexity of the material being studied, and its applied focus, depending on the future profession.

The principle of quantization of educational material means breaking the material into sections consisting of modules, minimum volume, but closed and integrated content.

The principle of completeness (integrity). Each thematic module electronic manuals must have a fragment of the content of educational material; checklists; examples; tasks and exercises for independent solving; testing throughout the module; the context-sensitive help; a historical review.

The principle of collection. Electronic textbooks and other didactic educational packages should be integrated in formats that allow to compose them in a single electronic systems, to expand and to add new sections and topics, and create an electronic library for individual disciplines.

The principle of branching means that the modules electronic manuals should be linked hypertexte links to the student was the ability to go into any other sections that implement consistent study of the subject.

The principle of regulation. The student has the opportunity to call to the screen any number of examples in self-managing change web pages.

Each of the didactic principles are equally important, they are all interrelated, interdependent. Considered the principles and recommendations on their

implementation is not ready-made recipes, they should be used creatively, drawing on their knowledge of teaching methods, and necessarily complex.

Thus, when creating a multimedia textbook should be specific to computer-based training, to implement these principles in a software product, to determine how best to bring it to the nature of the cognitive activity of students.[11]

1.2 Analysis software for the development of e-course

The developers of e-learning courses often face the problem of selecting the proper software. What are the options the market offers e-Learning and what key features does each tool? It takes a long time to analyze the pros and cons.

In order to decide was easier, there was prepared a comparison of three tools for developing e-learning courses: 9 Adobe Captivate, Articulate Storyline iSpring Suite 2 and 8.3.

The results of the evaluation according to the criteria from one to five.

Table 1. Comparative characteristics of software products

Features	iSpringSuite 8.3	Captivate 9	Storyline 2
Price	$377	$1,099	$1,398
IntegrationwithPowerPoint	+	–	–
PublishinginFlash	5	4	4
Publishin HTML	5	4	3
Adaptation player for mobile devices	5	4	Notsupported
Themobileapp	5	Notsupported	4
Publish the video (MP4) / Download on	5	5	Notsupported

YouTube			
The recording of the audio soundtrack	**5**	**4**	**4**
Recordvideo	**5**	Notsupported	Notsupported
The synchronization of audio, video	**5**	**4**	**4**
Audioeditor	**4**	**4**	**4**
Videoeditor	**4**	**3**	**3**
The entry screen of the monitor	**5**	**4**	**5**
Adding media and external resources	**5**	**5**	**5**
Characters	**5**	**5**	**5**
Navigationsettings	**5**	**4**	**4**
Tests	**4**	**3**	**5**
Interactivity	**3**	**4**	**5**
Dialogsimulators	**5**	Notsupported	Notsupported
Customizableplayer	**5**	**4**	**5**
Support LMS	**5**	**5**	**5**
Securitysettingscourse	**5**	Notsupported	Notsupported
Section 508	**4**	**4**	**4**
Supportforeigncharacters	**4**	**5**	**5**
Integration with their own LMS	**5**	**5**	**5**
Integration with cloud service for file-sharing	**5**	Notsupported	Notsupported

Additionalfeatures			
Freeform-issues	Notsupported	**4**	**5**
Triggers	**4**	**4**	**5**
Variables	Notsupported	**5**	**5**
Speech synthesizer (text to speech)	Notsupported	**5**	Notsupported
Supportforgeolocation	Notsupported	**4**	Notsupported
Previewonvariousdevices	**4**	**5**	**3**
Theeffectsoftransitions	**5**	**4**	**4**
Animation	**5**	**3**	**5**
Softwaremodeling (softwaresimulation)	Notsupported	**5**	**5**
SupportWindows 32/64-bit	Have/Have	Not/Thereis	Thereis/There is

AdobeCaptivate 9

Pros:

♣ Free built-in library of characters and templates

♣ Speech synthesizer (option text-to-speech)

♣ Simultaneous development of multiple versions of the same course for different devices

♣ Questions Free form and drag-n-drop

♣ Software modeling (simulation programs)

♣ Variables and triggers

Cons:

♣ It takes special training to learn the program

♣ There is no video editor

♣ No mobile apps to view the created courses

♣ There is no tool to create dialog simulators

A piece of software that allows you to create interactive courses with triggers, variables and layers. Adobe Captivate 9 has a unique feature of converting text to speech, which can be conveniently used to create voice guidance. The tool offers the possibility to develop materials for various devices, but that they were adapted to the mobile format, you should select the type of project Responsive Projects. When importing PowerPoint presentations you use a different project type, so do their adaptive program does not allow. In addition, the program does not always works stably, and for mastering all the functions required training.

Articulate Storyline 2

Pros:

♣ Illustrated characters have flexible settings

♣ Questions Free form and drag-n-drop

♣ Software modeling (simulation programs)

♣ Variables and triggers

♣ Free mobile app for iPad and Android devices for viewing material

Cons:

♣ No publication in video

♣ You can't add a video

♣ Materials are not adapted to the mobile device

♣ There is no tool to create dialog simulators

♣ High price

Articulate Storyline 2 is software that allows you to create interactive courses with triggers, variables and layers. Has easy navigation due to the fact that the program interface is similar to PowerPoint, but also offers the possibility of using the basic effects are similar to effects PowerPoint. At the same time, created materials are not adapted for mobile devices (displayed in the same form at a reduced size), so with a tablet or smartphone to interact with the course quite difficult.

iSpring Suite 8.3

Pros:

♣ Interface in Russian language

♣ Easy to learn, work in a familiar environment PowerPoint

♣ The use of ready-made PowerPoint presentations

♣ Player and course content adapted to the mobile device

♣ Includes a unique tool for creating dialog simulators

♣ The ability to quickly share the created content using a cloud service iSpring Cloud

♣ Free mobile app for iPhone, iPad and Android devices for viewing offline

Cons:

♣ Little of interactivities

♣ No software modeling (the possibility of creating simulation programs)

♣ No questions FreeForm

♣ No variables, it uses triggers PowerPoint

iSpring Suite is installed as a PowerPoint add-in. Work with the program does not require special skills, so course developers can immediately start using it. In the iSpring Suite includes the built-in editor of tests iSpringQuizMaker, unique TalkMaster editor dialogs and other components that expand the functionality of PowerPoint. The tool provides high quality conversion to Flash, HTML5 and video with all the PowerPoint effects. Adaptive allows the player to create content for any device: from computer and laptop to tablet and smartphone. Some limitations iSpring Suite associated with the ability to work with variables, as well as a selection of interactivities. However, of the considered tools iSpring Suite only has an interface in Russian.

Adobe Captivate and Articulate Storyline installed as a separate software and does not depend on the PowerPoint, which can be used as a base for creating courses. These tools also provide a graphical environment for managing objects on slides. The task of user interaction is solved using variables and system States. Tools Adobe and Articulate are used to develop challenging courses and usually require special skills or training.

1.3 Description of the features of the software Articulate Storyline

Articulate Global, Inc. Storyline is one of the most famous programs for creating interactive e-learning courses. The program is easy to use and designed for different tasks create courses. Storyline has retained its original features other products from Articulate Inc. – the most user-friendly graphical interface and careful design of not only the content but also the interface in which the developer courses. In other words, products like Articulate not only developers, but also those who is made with it courses [12].

Articulate Storyline 2 — suitable for beginners and for professionals. The program provides developers with virtually unlimited ability to prepare complex interactive scenarios. It has all the tools to build scenarios of the training courses without the use of Flash or programming, has a simple user interface and intuitive features. In the system there is a training course, templates, tutorials, tips and free downloads from the developer's site

Features of Articulate Storyline:

• **Intuitive user interface.** A simple interface allows you to create courses from scratch or based on templates, without requiring additional user training. The logic and feel of the interface is similar to Microsoft PowerPoint.

• **Templates slides.** Create slides from scratch or using templates. Easy set templates.The ability to upload additional templates and slides from the course website E-Learning Heroes.

• **The characters.** Adding slides to 47 500 combinations of hand drawn and photopersonal, facial expressions and poses.

• **Interactivity.** The use of triggers to define when to run those or other actions. Working with layers slides to create a set of interactions between components in the slide.

• **Generate,** edit, and control the interactions of objects on slides.

• **State and variables.**The ability to configure objects to respond to actions of the student. For example, the button can change color when pressed, the characters change facial expression when a wrong action, etc. a Dynamic view of content on

the basis of user actions and defined by the author of conditions. For example, if a student answers incorrectly, he can open the slides with additional questions or with more simple tasks.

• **More than 20 different types of questions.** In addition, an arbitrary shape allow you to create questions with the help of any object on the slide.

• **Support Drag-and-drop.** Adding objects to a slide by dragging.

• **Record what is happening on the screen.** The record shows learners how to work with electronic course.

• **Simulation.** After a single screen recording Storyline automatically segments the recording into multiple step-by-step guides. The record is easily editable in case of errors it does not need to re-create. As a result, students can see how to perform the task, and also to place them in test mode.

• **Supports HTML5 and Flash**, as well as mobile devices. Publish courses in a variety of formats on the iPad, desktop PCs, laptops, devices Android, iPad, etc.

• **Support for Section 508**, writing of the language from right to left, SCORM-and AICC (in reporting).

• **Tree view of the course** (which is automatically generated).

• **Quite a convenient tool** for creating demonstrations, though with the possibility the slidesthe audio and create the video clip.

• **Choice of cute characters** (quite convenient mechanism of their settings).

• **A convenient and intuitive interface**, all major problems are solved directly on the workspace.

• **Many built-in high-quality templates**, design elements that can be used without additional configuration.

• **The possibility of creating** a common bank of questions.

1.4 Application features e-course practical exercises

To ICT include e-tutorials, textbooks, workshops, simulators and tests, e-courses, developed for use in training, the crucial didactic purpose and method of use in the educational process:

- electronic textbook is an integrated tool including the theory, reference, system diagnostics and other components;

- electronic grant acts as a support component of the educational process, issued in the form of a Handbook, the diagnostic system with limited coverage of the educational material focused on the study of a section of the discipline;the workshop complements the theoretical knowledge section, lying in the field of practical application to particular situations. Also the workshops is procedures to try themselves in the application of knowledge, to test your existing resource [13].

- simulators are designed to practice and consolidate any knowledge and skills, provide training at various levels of autonomy, control and self-control.

- electronic training courses (EUK) is an educational electronic publication or resource to support the educational process in institutions of General, special and vocational education, as well as for self-education in the curricula, including those aimed at continuing education. EUK allows you to perform all the main methodical functions of electronic publications:

• reference and information;

• controlling;

• functions of the simulator;

• simulation;

• modeling;

• demonstration.

To practical classes on discipline "Technology of creation of educational multimedia applications in Adobe Flash, appropriate use of e-course. E-the course is aimed at implementation of individual tasks, contains information, for easy study of the program Adobe Flash, allows you to organize independent work, control and self-control, helps teachers efficiently use the time training [14].

In modern conditions very quickly change graduation requirements, requires not only knowledge but also the ability of a specialist to apply this knowledge in practice in the solution of professional and social functions. These changes are accounted for in the model programs and curricula of disciplines. In the learning

process can be great to learn theory, to demonstrate skills for exams and tests, but in real professional action it is necessary to form the competencies which are considered as a compound of knowledge, abilities and skills with real practical professional action [15].

When performing practical tasks using the e-course the students form their corresponding skills and initial professional competences.Students work with electronic course develops the ability of independent performance of tasks, to organize their own activities, to implement the search for the effective performance of professional tasks, and this means to the development of General competences of the future graduate [16].

Types of eLearning courses:

1. Video. Most often this type is used when you want to transfer remotely the speech of a particular person. However, in order for the roller is long kept attention – she must be very charismatic. But even in this case, it is very difficult to listen to video lectures and trainings and not to be distracted more than 10-15 minutes at a time. So this format is preferable for a brief incendiary speeches. Videos can also be presentation and explanatory.

2. Record your desktop with sound. This option is often used when training to work with computer programs. Its advantages are obvious: the listener sees the screen (most often with the program's interface), sees the actions of the teacher on the screen and hears his voice. The disadvantage is the same as in the previous case, it is very difficult to focus on the screen more than 10-15 minutes at a time. Then the concentration decreases, people get tired. This type is also good as a supplementary learning material that supports the main course [17].

3. The electronic textbook. This is one of the most common types used in many Universities for the distance education students. Cons he has the same as that of the ordinary textbook: the issues of motivation to learn, the student's personal file. The tutorial does not help myself to read, does not contribute to his learning (he can only be more visually pleasing and comfortable for reading or less). Although good e-books have advantages: the clear structure of presentation,

through which remote students can learn the material in sequential and in any order and need to return to him the chapters and fragments [18].

4. A slide presentation. This option is more convenient for learning than the text tutorial going "solid sheets", the listener can return to certain slides.

5. The interactive course. These courses are created in specialized programs. Their main advantages compared to previous types are an opportunity to evaluate the learning outcomes (integral test), the possibility of building a learning algorithm depending on these results and the possibility of integration in the course of any object, including multimedia (document, audio file, video file, picture, photograph, drawing, etc.) [19].

This is particularly important for studying the operation of complex technical devices. Often in such courses put links to legislation simulation exercise (this is important for students of technical faculties). There are various options for providing access to training courses. The most simple and clear record of the course on CD-ROM, but in this case the entire responsibility for the course lies with the listener. Control the training from the outside is only possible by classical tests and exams. Often used access to training courses from the special page.[20]

The disadvantages of this method is the same as that of the previous one - the lack of transparency and the lack of external control. To control the process and learning outcomes is possible, if a course is placed in a special shell: the e-learning platform. It is also called LMS (Learning Management System). A good LMS allows you to see when the listener is logged, the pages they studied, how long he'd been there and retains the test results [21].

This is especially important when personnel evaluations, if the necessary statistics for such a long period and the growth in staff. Professional programs for the development of training materials provide training training in the form of sets of HTML files (including packages support SCORM 2004, Scorm 1.2 and AICC is worldwide accepted standards), Zip archives as well as protected publications. In these programs usually include search capabilities, the inclusion of the Glossary

and appendixes. In order for the user to feel confident, often developers create special instructions for working with the course.

Chapter 2. DEVELOPMENT OF ELECTRONIC PRACTICAL COURSE WITH USING THE ARTICULATE STORYLINE PROGRAM

2.1 Phases of development of electronic practical course with using the Articulate Storyline program

The creation of an electronic course of lectures in the Isma instrumental environment ArticulateStoryline begins with the installation of the software on the desktop of the Creator of the course. After you install the source environment, run the following sequence of actions for creating e-course:

Run the software package ArticulateStoryline

Run the program Articulate Storyline
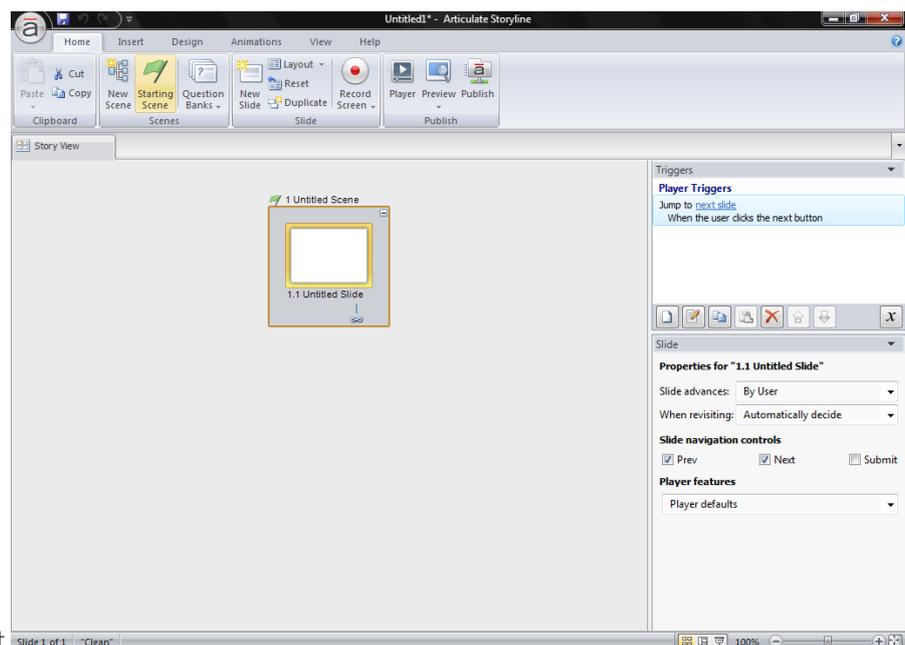
Create a new project

Create a new project in ArticulateStoryline

Select the layer for the first page
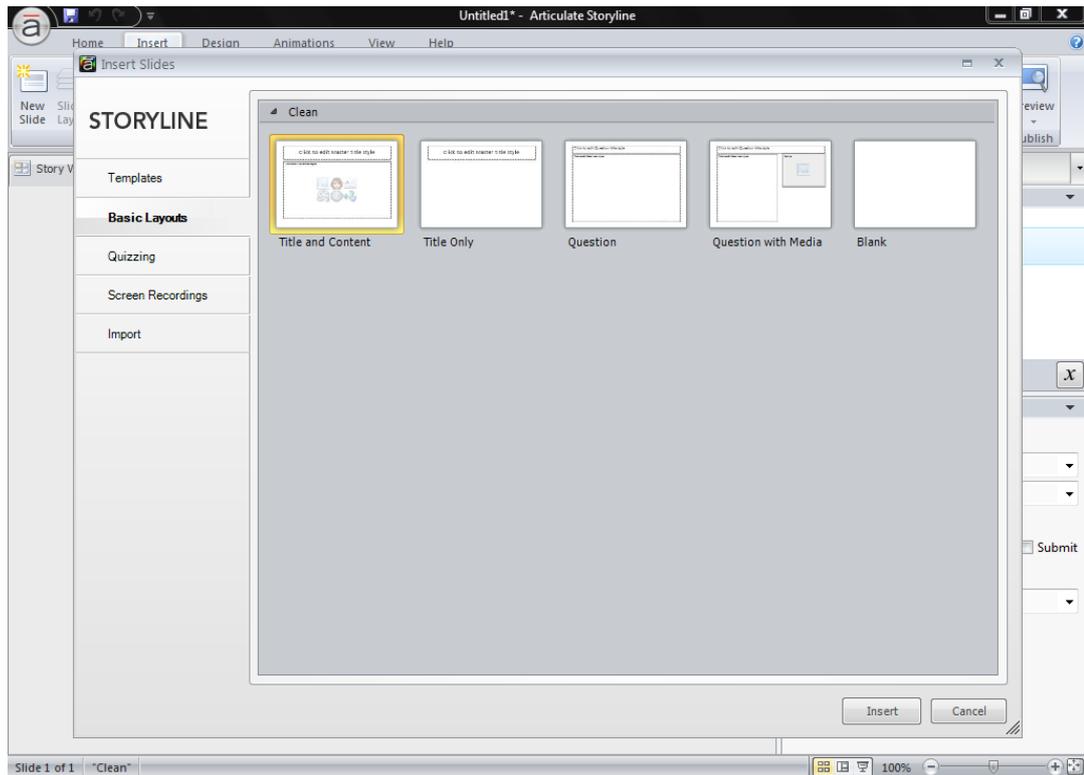
Create a layer project in ArticulateStoryline

Upload an image for the title page
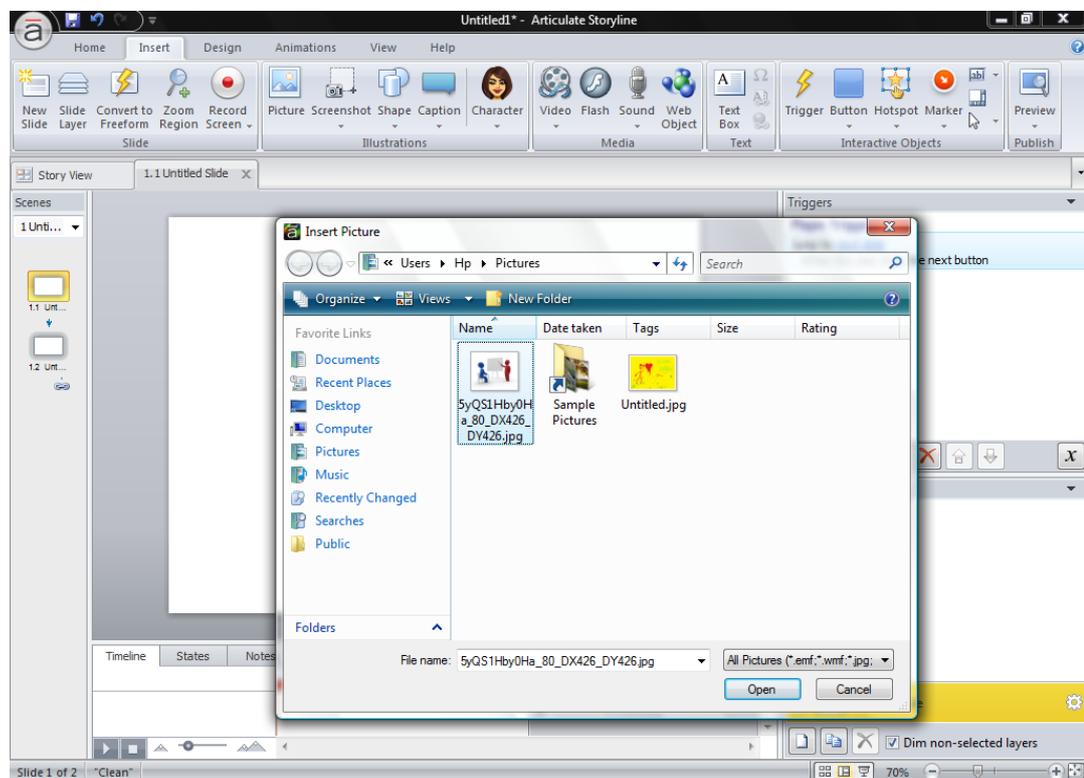
Download image for cover sheet

Change the design of your course
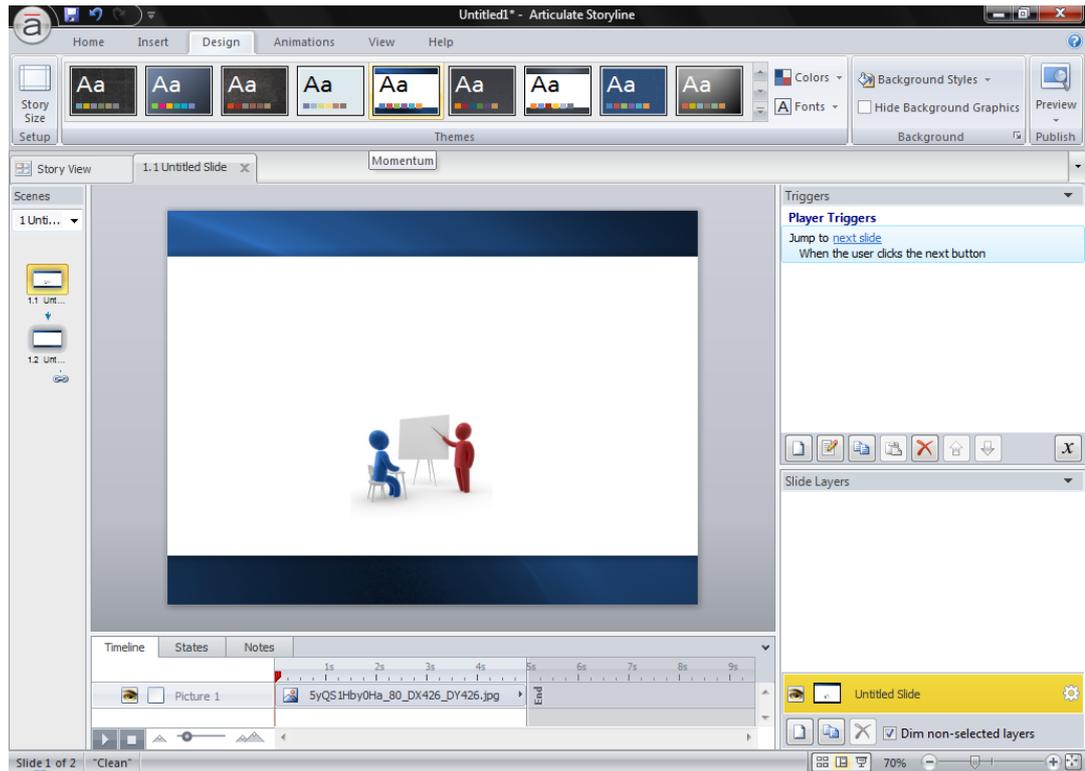
The redesign of the course

Enter the name of the course and will format i

The change of name of the course

The title page is ready
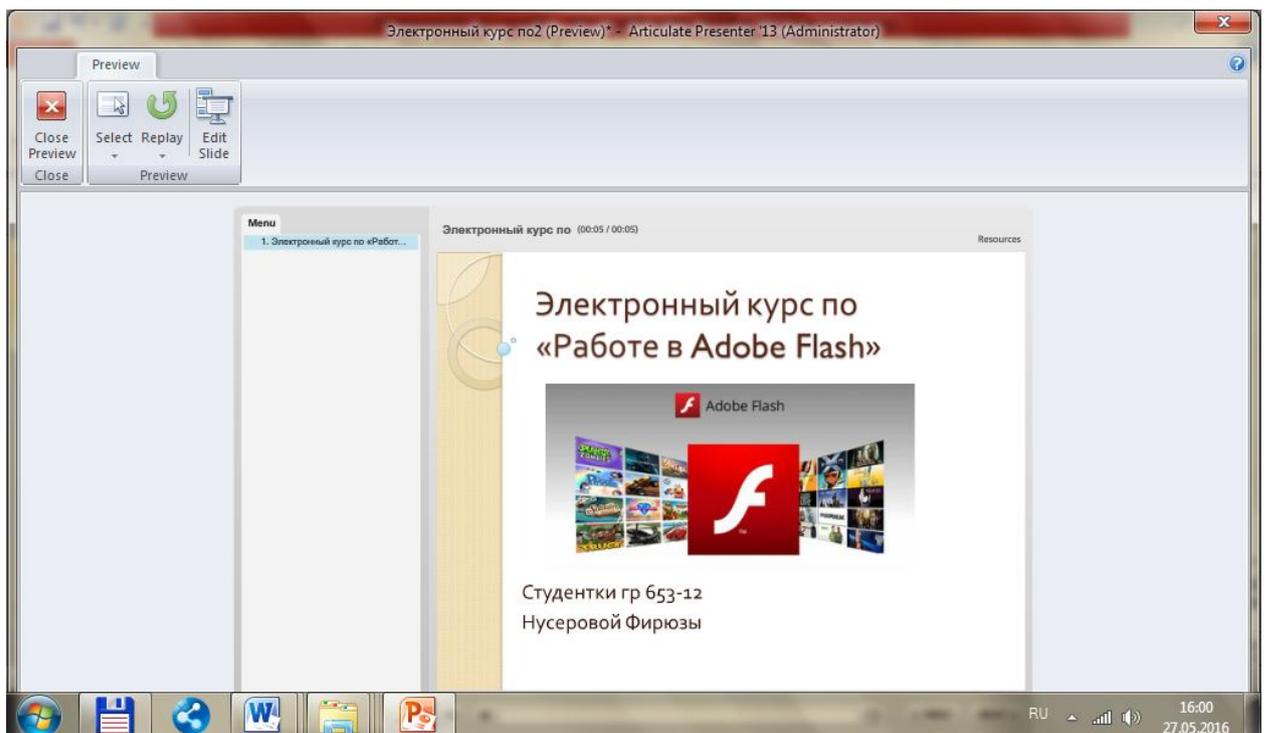
The finished cover sheet

Create course content
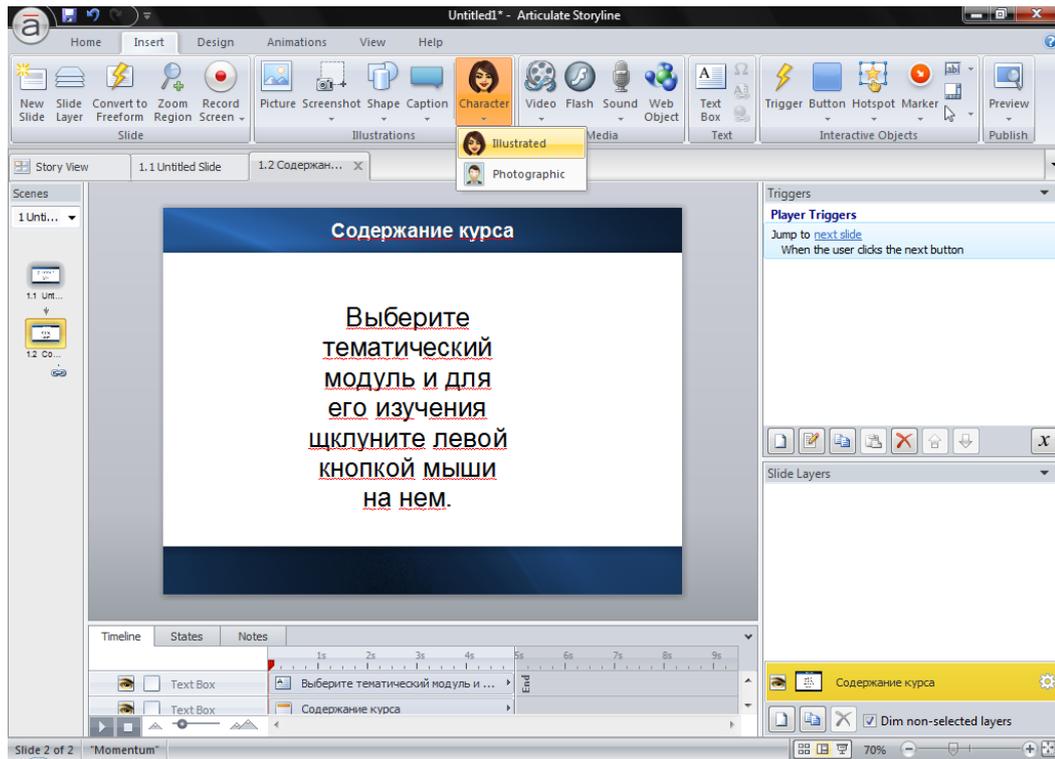
The creation of course content

Choose the personality of the teacher for the course, its location and character
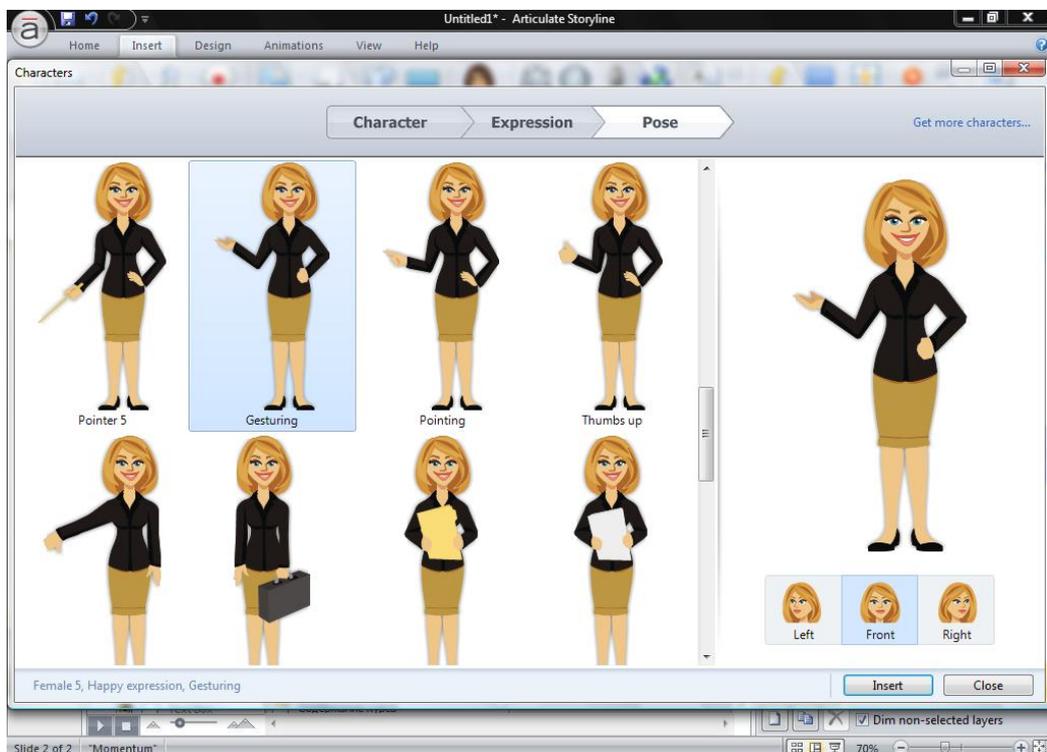
The choice of the individual teacher

Custom layout and add the course literature for the course in Resources
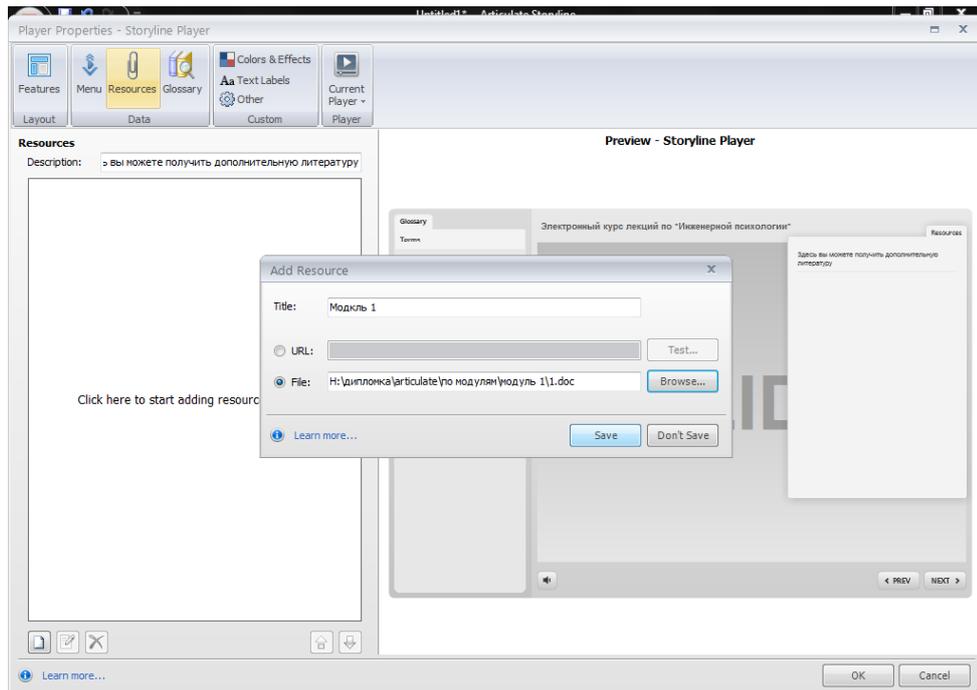
Adding resources

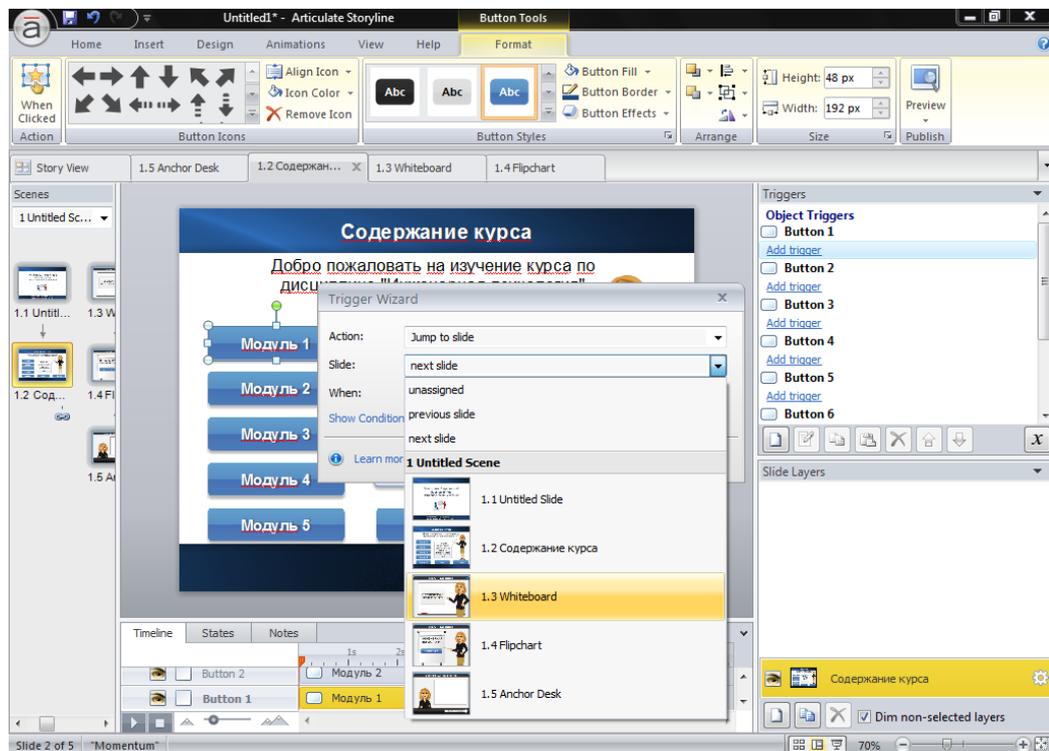Now add terms to the Glossary using ordinary text insertion
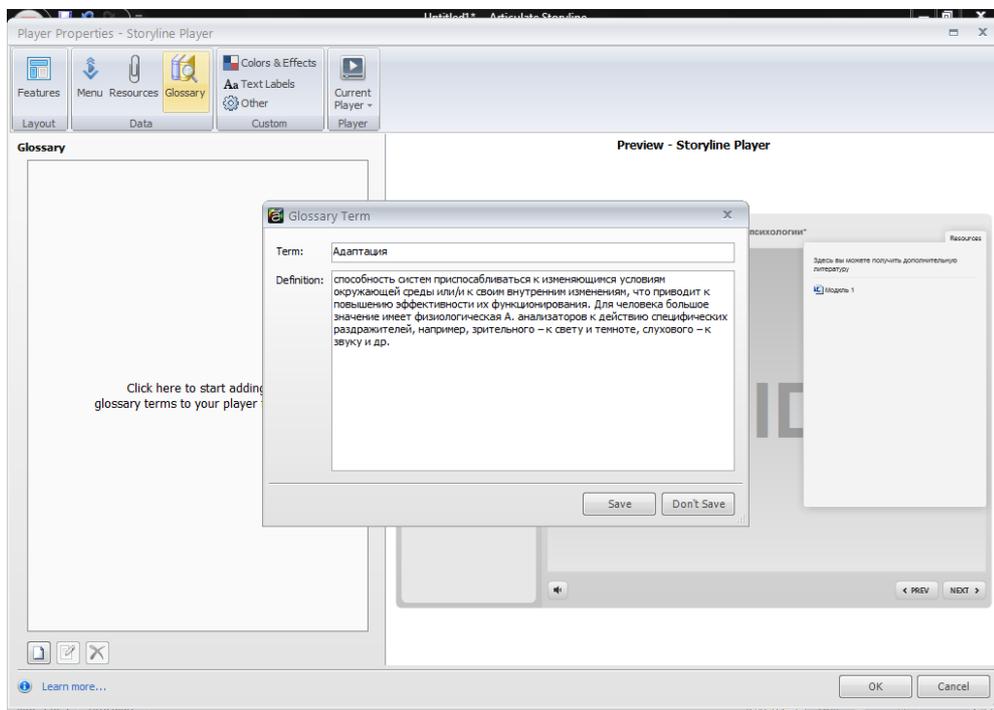
Adding terms to the Glossary

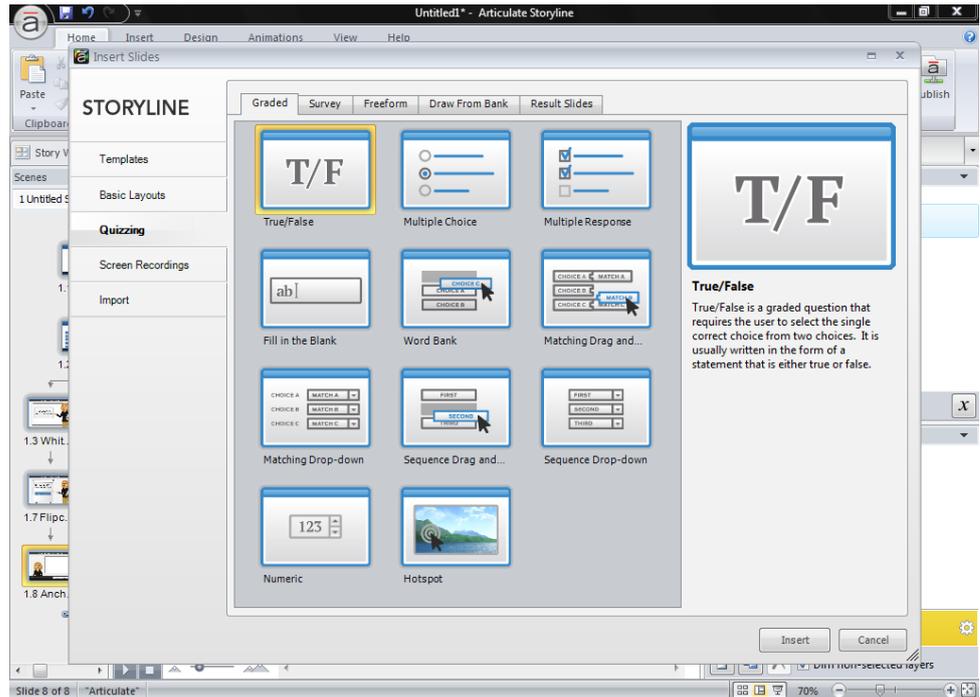## Selectable interface language ready of course
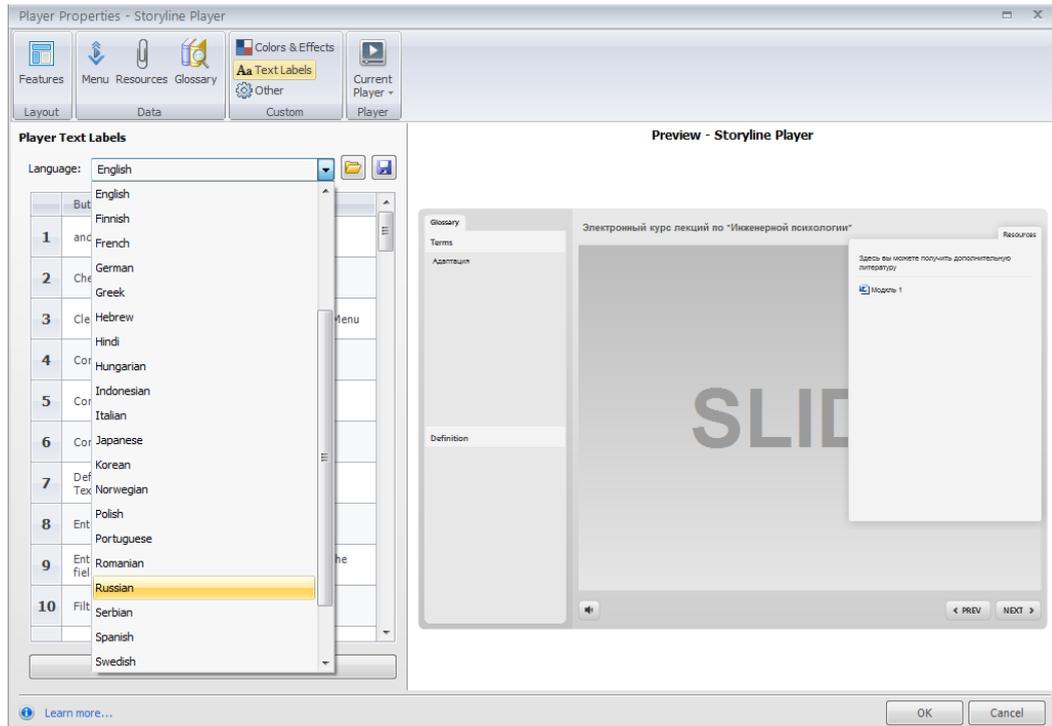
The choice of the language course
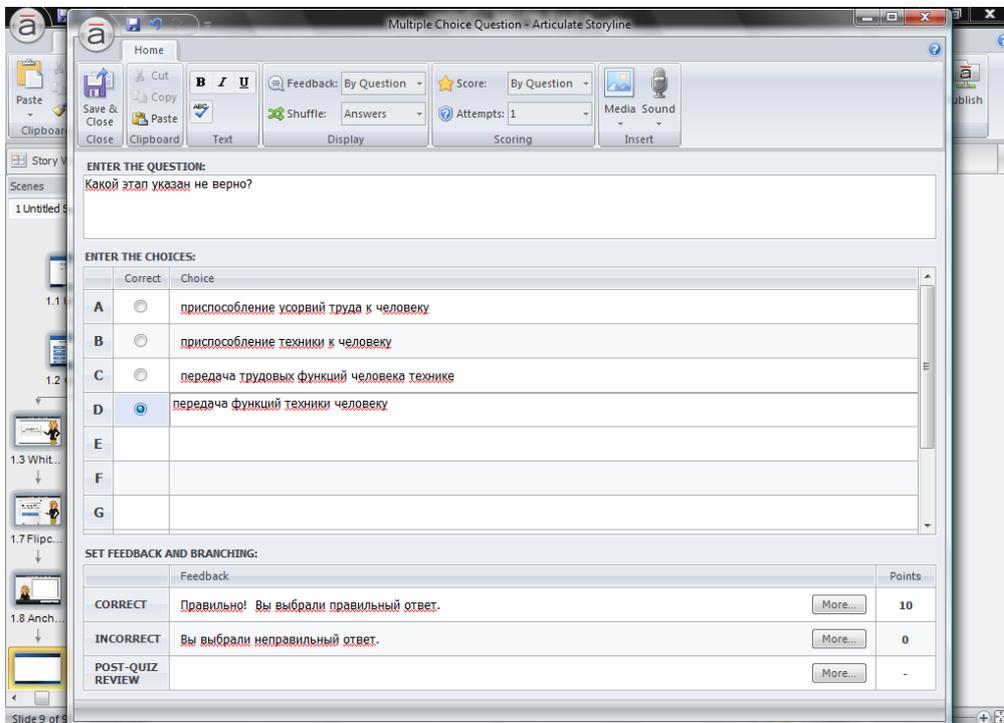
Added triggers on buttons modules

Add a trigger to the module buttons

In this program there is the ability to create multiple types of quizzes and interactives
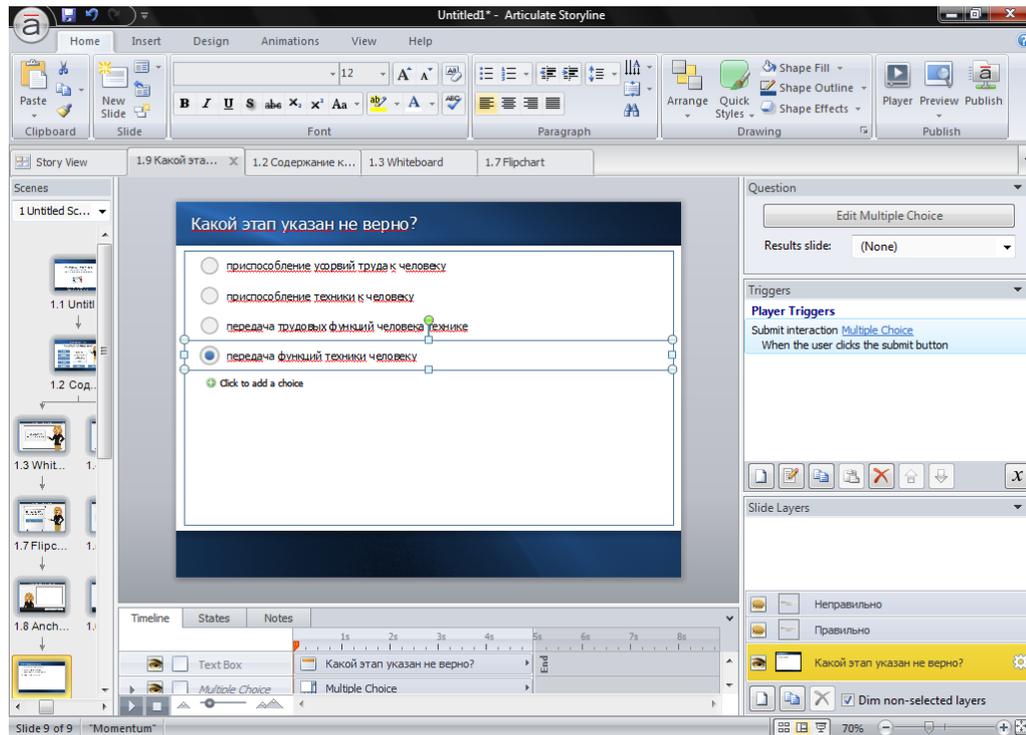
A variety of types of tests and interactives
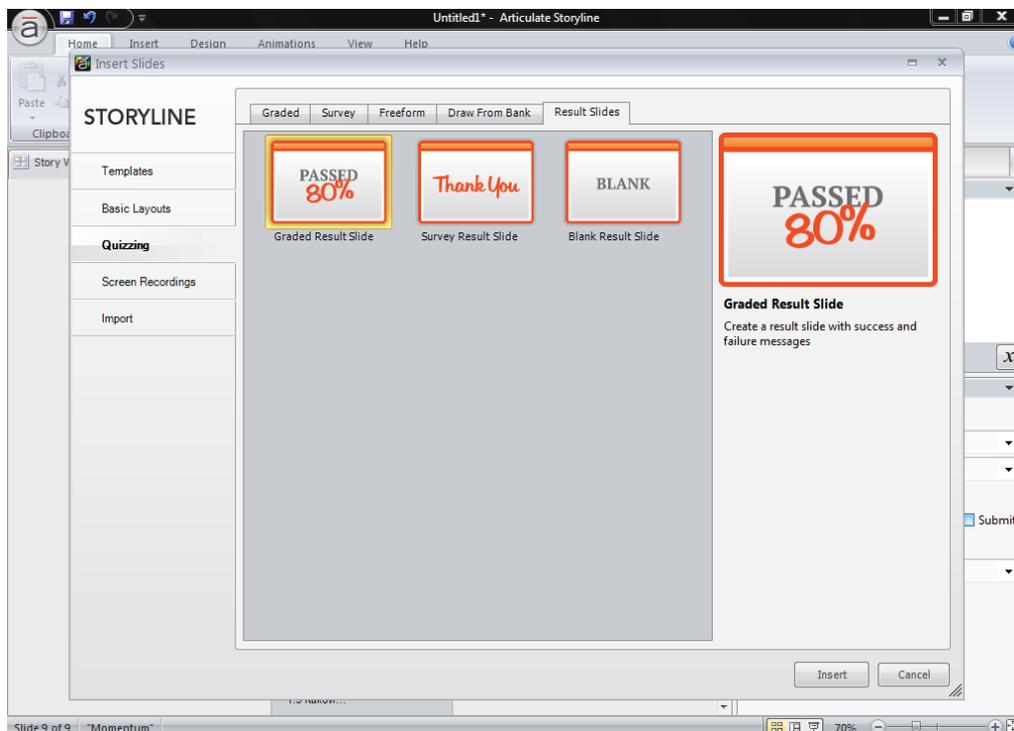
Create a quiz with only one correct answer

Create a test with only one correct answer

Clicking Save&Close, close the window, create and edit test and get the slide with the test
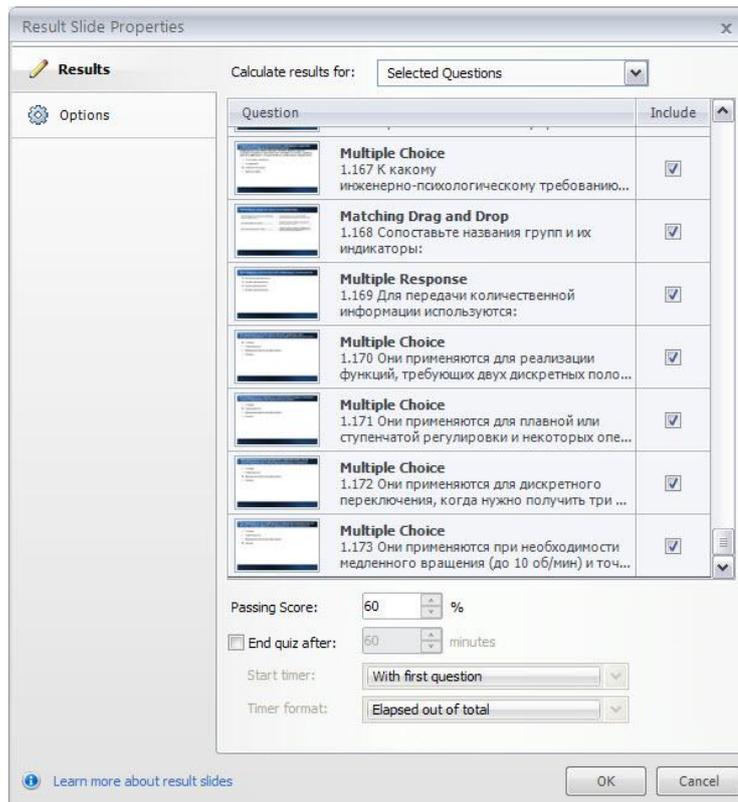

Ready quiz slide

Add a slide count of test results

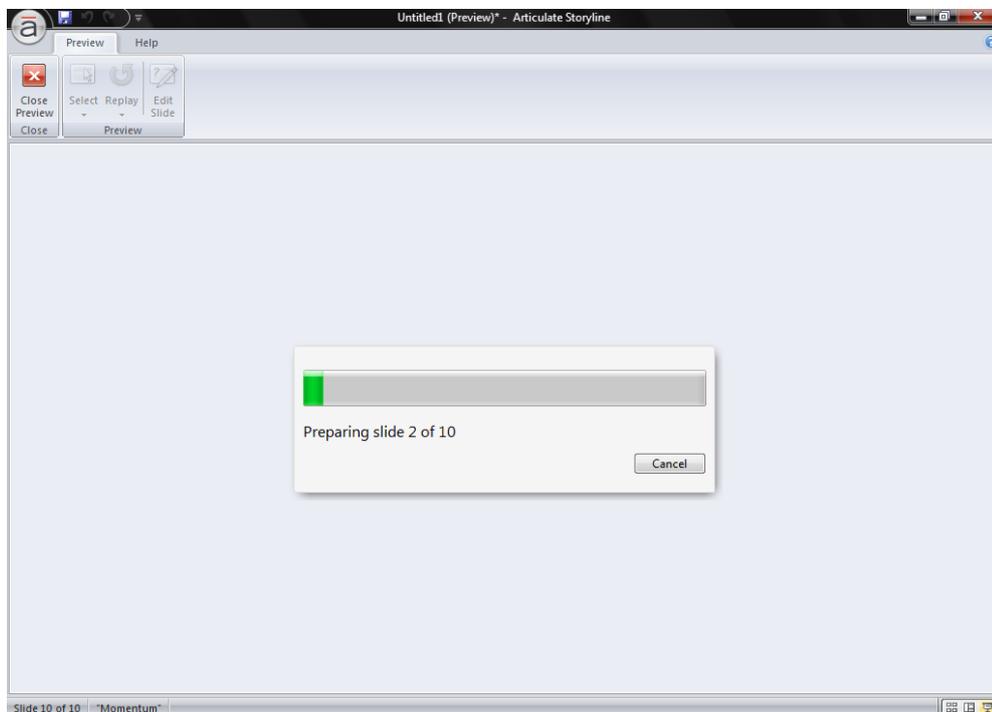

Add a slide count of the results

Editable list of questions to calculate results

Edit the list of questions

Ongoing preview before the subsequent creation of the course modules

Preparation for preliminary viewing of the course

Check the work quizzes' part
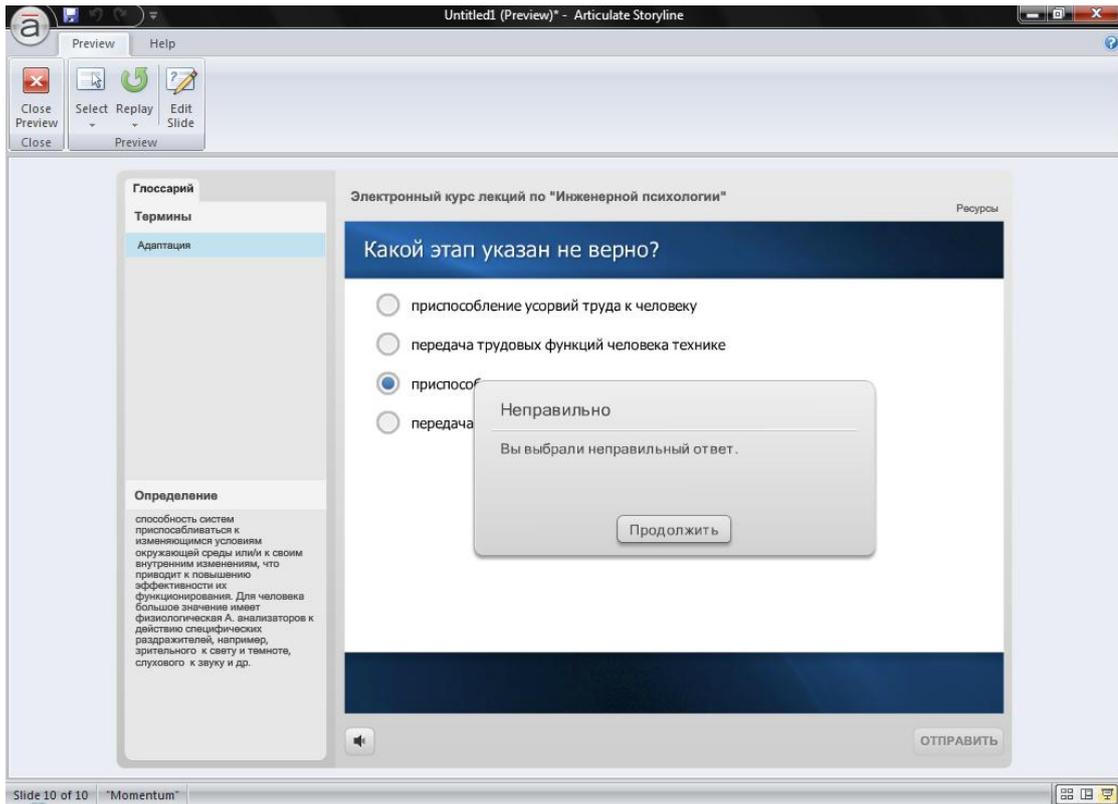
Check the operation of the test course

In the same way create the remaining modules of the course
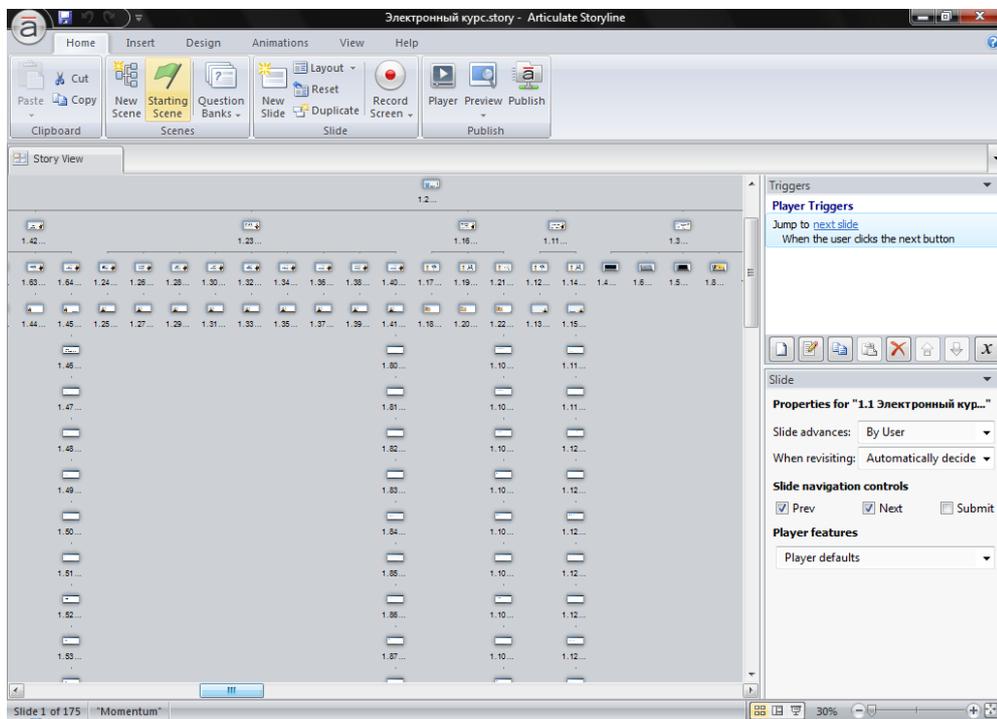
Structure ready of course

There are several formats of publication of course, but we for was published online. Also here you must specify the name of ready of course and its location after the conversion.

Preparations for the conversion rate

Convert course.The process of conversion rate

2.2 Methodology and organization of practical training

Practical occupation - one of the main forms of organization of educational process, which involves students under the responsibility of the teacher explaining complex learning tasks with the purpose of mastering scientific and theoretical foundations of the discipline, skills and experience of creative activity, mastering by modern methods of practical work with use of technical means. Practical classe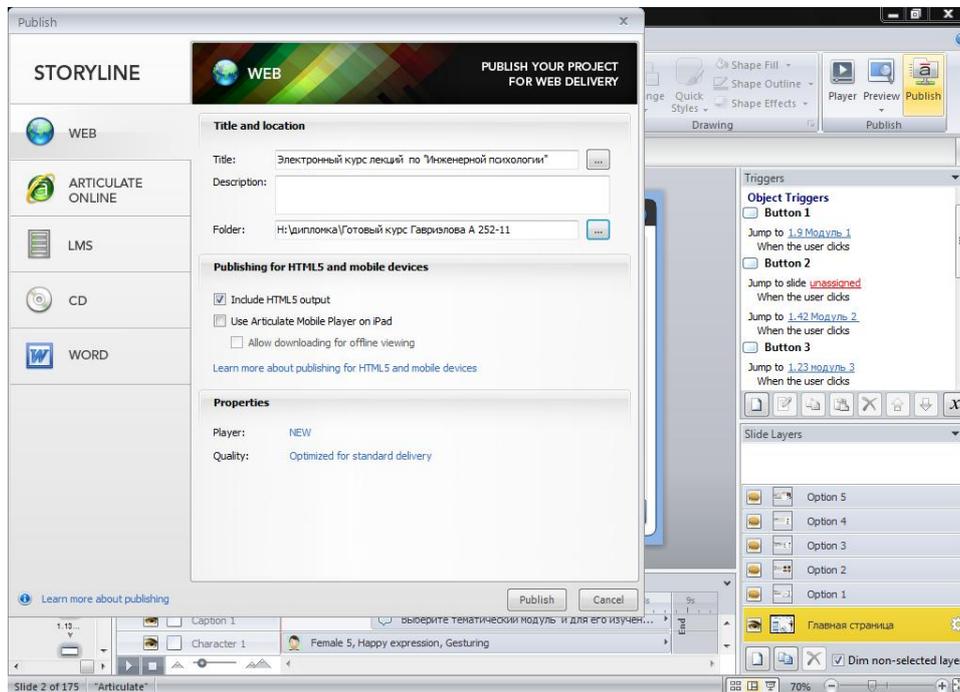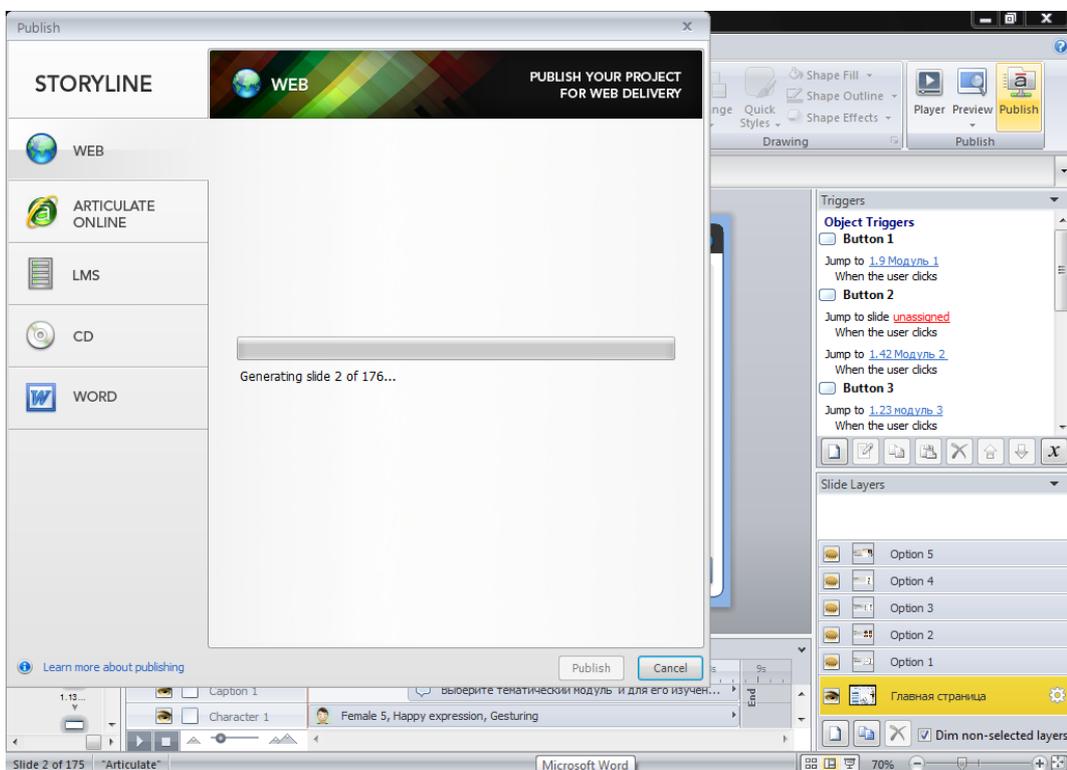s are conducted after lectures giving the theoretical basis of their performance. Allowed to be held in La boratornoy (practical trainings) before reading lectures to facilitate learning of theoretical material in the presence of descriptions of practical works, including the necessary theoretical information or links to specific academic publications containing this information.[22]

During practical classes students are required for an intermediate writing and constitute the final written report. Reports on the executed work are submitted at the end of the lesson, the teacher to check.

The aim of the practical classes: managed the organization of cognitive activity of students in conditions close to real practice [23]. Tasks of practical training:

• the consolidation, deepening and broadening students ' knowledge in solving specific practical problems;

• developing cognitive abilities, independence of thinking, creative activity of students;

• to develop the ability of logical thinking independently obtained data;

• mastering new methods and methods of a specific academic discipline;

• ensuring rational combination of collective and individual forms of learning.

Practical lessons:

• cognitive;

• educational;

• educational.

Practical lessons on the nature of the services provided by students assignments are divided into:

• study undertaken to consolidate and concretize the theoretical material studied;

• analytical, aiming at obtaining new information on the basis of the formalized methods;

• creative associated with obtaining new information through self-sufficiency of selected approaches to solving problems.

Forms of practical training organization in accordance with the specific characteristics of academic disciplines and learning objectives can be:

• exercise;

• trainings;

• solving typical problems;

• classes with the decision of situational tasks;

• sessions on simulation of real problems.

• business game;

• role-playing games;

• game design;

• simulation exercises;

• outreach activities (organizations, institutions) with specific tasks;

• classes-contests [24].

STRUCTURE PRACTICAL

Typical structural elements (practical) classes are:

- the introductory part,

- the main part,

- the final part.

The introductory part provides training for students to perform for the appropriate work. It is composed of:

• formulation of themes, goals and objectives of the lesson, the rationale for its importance in the professional training of students;

• considering the links of this topic with other topics of the course;

• presentation of the theoretical foundations of the work;

• the characteristics of the composition and characteristics of the work tasks and an explanation of the approaches (methods, techniques) to implement them;

• feature requirements to result of work;

• an introductory briefing on safety in the operation of technical means;

• check the readiness of students to perform tasks of work;

• test performance of tasks under the guidance of a teacher;

• guidance on self-monitoring of task execution results students.

The main part is intended for independent performance of tasks by students. May be accompanied by:

• further explanation is given in the course of work;

• elimination of difficulties in performing tasks of work;

• ongoing monitoring and evaluation of performance;

• by maintenance technical means;

• answers to students ' questions.

The final part contains:

• the final results (positive, negative) classes;

• an assessment of the performance of individual students;

• answers to students ' questions;

• issuing recommendations for improving the performance and elimination of gaps in the knowledge and skills of students;

• collection of students reports on the work performed to verify a teacher;

• presentation of information about the preparation of the following work, in particular, be studying the academic literature.

The introductory and concluding part of the laboratory (practical) classes are held front. The main part is performed by each student individually [25].

ASSESSMENT CRITERIA PRACTICAL CLASSES

1. Evaluation criteria content practical exercises:

• compliance topics and content of the educational-thematic plan and the working program of the discipline;

• the clarity of objectives and tasks of occupation;

• the opening session of the organic unity of theory and practice in the solution of specific problems;

• the inclusion of theoretical material from the standpoint of the content of the lecture course, availability of textbooks and other sources;

• the accuracy and reliability of given information;

• to reflect the modern level of development of science and technology, culture and art;

• professional orientation classes, the link to the profile training of students;

• coordination of tasks with the content of other forms of classroom and independent work of students;

• implementation of inter-subject and interdisciplinary connections.

2. Evaluation criteria methodology practical (laboratory) classes:

• didactic validity of forms of conducting classes and use corresponding methods;

• content structure lesson: availability introduction, main and final parts;

• the validity of the composition of the tasks of work and justification of methodology and the consistency of implementation;

• clarity and precision of requirements to results of work;

• consistency, accessibility and persuasiveness of the presentation of the theoretical foundations of work, methodical instructions;

• demonstration of techniques of performance of tasks;

• serial transfer of students from assignments under the supervision of the teacher for independent solving problems;

• the use of methods of enhancing students ' attention;

• the use of methods of fastening of information during the lesson;

• the use of effective methods of monitoring the progress and results of tasks execution of work;

• to ensure that self-monitoring of progress with students;

• analytic and differentiation of summing up the work at the end of the lesson;

• the volume of jobs the rules of the classes (nedovrsenoj, congestion, etc.);

• considering the individual characteristics of students and use individual approach to students, to their possibilities of perception and assignments [26].

• rational combination of methods of collective and individual work of students.

3. Evaluation criteria organization the practical (laboratory) classes:

• compliance topics and the amount of hours devoted to class, educational-thematic plan of discipline, training schedule;

• clarity of the beginning of the lesson (time delay, the entrance of the teacher into the classroom, a greeting, a good first phrases, etc.);

• sharpen the end of classes (the presence of the conclusion, summing up, end time classes, farewell to students, etc.);

• attendance of classes by students;

• the preparedness of students to the lesson;

• discipline during classes;

• rational allocation of time in class;

• availability in the required number of descriptions of laboratory (practical) work;

• that every student has an individual working place;

• the use of feedback with students;

• availability in the required quantity of the required technical, visual and provide tools, training packages;

• compliance training laboratories, specialized office requirements to the organization of work (adequacy of space, design, ergonomics, the availability of individual workplaces, etc.);

• adaptability classes [27].

4. The evaluation criteria guide the work of students in the course laboratory (practical) classes:

• implementation of current control tasks and preparation of reports on results of their performance;

• assisting students in performing tasks;

• the use of methods of enhancing attention and activities of students;

• assessment of the assignments and operational decision-making to solve the

students difficulties;

• differentiated evaluation of students' work according to the results of assignments, recommendations for improving the performance of students.

5. Evaluation criteria pedagogical profiles of the teacher:

• knowledge of subject matter, professional competence;

• belief in the appropriateness of study subjects from the standpoint of professional growth of the student;

• the emotion, the excitement of writing;

• the ability to mobilize the audience's attention, to arouse interest in performance of tasks, to create creative atmosphere of the classes;

• ability to establish contacts with students;

• level of interaction with students (all students, multiple students, etc.);

• style attitude towards the students (careful, demanding, indifferent, disrespectful, etc.);

• the style of students' attitudes towards teacher (respectful, ironic, indifferent, etc.);

• the organic nature of the inclusion of the teacher in independent work of students during classes;

• the appearance;

• demeanor, the ability to stand before an audience;

• culture of speech, diction.

6. Criteria for performance assessment practical (lab) classes:

• implementation of goals and objectives of the work;

• the degree of fulfilment of tasks of work;

• the degree of conformity of results with the specified requirements;

• the degree of formation of students the necessary skills;

• the degree of educational impact on students;

• informational and educational value.

2.3 User's guide for working with the e-course

Articulate Storyline is a quality and easy-to-learn program for creating interactive multimedia content, primarily educational direction. It's often compared to Adobe Captivate, compared with which it has a number of both the advantages and disadvantages. For example, the latter is able to export videos in video format for posting to YouTube, has more opportunities to work with sound, has built-in library of objects, etc. And if we talk about the more popular program CourseLab, there is present a powerful built-in programming language, with which you can even make a toy like Tetris. However, if Articulate Storyline and gives in some detail, it is possible to forgive for a number of unique chips and, most importantly, a vibrant visual style rollers. [29]

When working in Articulate Storyline, you need to consider for what purposes You are going to work on this program. For example, for full editing or creating training tutorials, ideal Articulate Replay, which built all the elements for quality video creation.

For a more extensive study, you can use Articulate Presenter.It can be used not only to create a multimedia feature presentation, but also to create an electronic course that can be converted to e-portal website.[30]

If you want to quickly create an information portal, equipped with the right information and make it available to any user, you can use Articulate Engage. Articulate Storyline opportunities are large and available to any user. At work e-course practical classes in Adobe Flash, go to section e-courses. Open in browser page Presenter. To choose the desired section.For example, video or training material. And to use this information.

2.4 Methods of conducting practical lessons on discipline "Technology of creating multimedia products in Adobe Flash"

E-learning can be used to prepare students for 1-2 courses , information and teaching areas.

E-course has a strong practical orientation, which determines the logic of the material of the training sessions. Instead begin with a detailed study of each tool Adobe Flash is offered for the first classes to explore the most common ways to get graphic images. Examines the principles and techniques of creating computer animation using Adobe Flash . E-course is based on the lessons of the textbook. With practical examples, students become familiar with the techniques and features to create vector drawings in Flash, learn frame by frame animation, shape tweening and motion tween [31].

Thus, "Technology of creating educational multimedia applications in Adobe Flash": to convey to students the information that is important for their productive activities; to ensure the adoption of educational information; to encourage the use of this information; to work out and strengthen practical skills in the application of new knowledge.

Learning goals for practical lessons held in the educational process are the following: to enable the students to study the program Adobe Flash. Learn how to create animation, edit images, to save correctly. To have basic concepts of tools in Adobe Flash [32].

Topic: "Technology for creating educational multimedia applications in Adobe Flash".

Type of studies: practice

The goal: to Give students basic knowledge of the basic concepts of Adobe Flash.

Develops: memory skills, developing the ability to use the acquired knowledge, forming mental skills, abilities, and bringing them to automatism, development of creative abilities.

Educational: to foster a sense of rationality and concreteness, foster care, diligence, efficiency, interest in the study of engineering psychology, responsible attitude to learning, accuracy and careful attention to technique, independence, discipline.

Assuring:

1. Visual AIDS :e-course, reflecting all necessary material for lectures.

2. Distributing material: tasks that provide feedback

3. Those. teaching tools: computers and local area network in order to demonstrate the e-course.

Thus, this chapter considered the nature, characteristics, structure, characteristics and main stages of designing and creating EUK.

In the end, we can conclude the following:

1) Information on the chosen subject or course must be well structured and must represent fragments of the complete course.

2) Each fragment, along with the text should provide information in the form of audio or video.

3)the Text portion should be accompanied by numerous cross-references, allowing to reduce time of search of the necessary information. Promising element is the connection of a specialized glossary for a given subject area. It should be noted that the introduction of EUK capable, under certain conditions greatly improve the efficiency of learning. It was revealed that students with great interest, very actively, creatively mastered this discipline.

CHAPTER 3. LIFE SAFETY AND ECOLOGIES

3.1.Electromagnetic fields and radiation

Negative factors in the system "man - habitat" are divided into physical, chemical, biological, psycho-physical. When exposed to the human body, any of them can cause injury or occupational disease. Each negative factor characterized probability level and the exposure area as a person, and the components of its environment.

Electromagnetic fields and radiation is a major factor in the production sector, the negative impact on the human body - is ionizing radiation, and infrared (SRI), ultraviolet (UVB) and laser radiation;[33]

Electromagnetic fields (EMF) and radiation (EMR) are detected at any point in space and production facilities throughout the environment of the biosphere. An electromagnetic field is created by an alternating electric current. Permanent electrical current creates a constant electrostatic field.

The sources (natural and artificial) are:

Powerful radio station; industrial electrical equipment; research facilities; control and measuring devices; line of electromagnetic transmission; atmospheric electricity; radio emission from the sun and galaxies.

Electromagnetic radiation permeated the surrounding area. The man is a source of low intensity EMR. In nature there are natural sources of electromagnetic radiation.

The natural sources of EMF include atmospheric electricity, solar radio emission and galaxies (CMB evenly spread in the universe); electric and magnetic fields of the Earth (storm - low emission EMI).

The harmful effects of EMR on man increased in the second half of XX century. due to the increased role of man-made sources of EMI: 1) production - a device for the induction of various materials (furnace, foundry aggregate); sources to ionize gas, producing a plasma; Device for welding plastics and compression; power lines, especially high; Switchgear; measuring devices, etc .; 2) in the home -

electrical wiring; 3) the radio stations, television stations, power transmitters and antenna system etc.[34]

The impact of electromagnetic fields on the human body is strictly individual, and it did not affect all of the energy of EMF, but only that its part of which is absorbed by the body. Reflected or transmitted through the body of the energy EMF does not have any effect on him. The negative impact on the person manifests in the appearance of the feeling of heaviness in the temples and back of the head, headache; in the weakening of memory; in sleep disturbances, immune-biological reactivity of the organism, the endocrine system, central and peripheral nervous system; in violation of the cardiovascular system; changes in metabolism in brain tissues of the blood; in ocular (lens opacities, cataracts); in violation of metabolic processes.[35]

To protect workers from the adverse effects of EMF, the following measures:

- Hygienic regulation, the definition is extremely remote intensity EMF in the workplace;

- Preventing the spread of people in areas of high intensity EMF (sanitary protection zones; devices of automation and remote control);

- The use of RMS: 1) a decrease in the power source - a decrease in the parameters of the radiation source (protected amount) - the main absorbers - graphite, rubber, etc .; 2) screening of the radiation source - usually used metal plates that provide a rapid decay of the field in the material. However, in many cases, cost-effective use of the screen instead of the metal wire mesh, foil and radio-absorbing materials, cell lattice;[36]

- The use of personal protective equipment (screens, overalls, goggles);

- Carrying out the standard treatment and preventive measures.

Electromagnetic fields are used for cleaning semiconductor materials growing semiconductor crystals and films, containment gases extrusion of synthetic materials.

Biological effects

The main danger - EMF exposure can not be detected by the senses. Under the influence of the EMF energy is absorbed by body tissues of human. As a result, in the body of standing waves, which concentrates heat. This increases the temperature of the human body, there is local heating of tissues and individual cells.

Particularly dangerous for the heating of a weak thermal insulation (brain, eye, lens, organs of the intestinal tract).

EMF changes the orientation of the cells, reduces the activity of the molecules, causing cataract, skin disease "string of pearls".

EMF is functionally pathological nervous and cardiovascular systems: increased fatigue, sleep disturbance, hypertension, neuro-psychiatric disorders.

EMF Protection

• Protection of the amount - a reduction in the emission source.

• Protection of the time - reducing staff time to acceptable values.

• Protection of the distance - increasing the distance m / s from springs and jobs.

• Screening jobs or sources.

• Protection is carried out by remote control, process automation, alarm systems, fencing areas.

• Apply personal protective equipment: gowns, and others. Radio-protective overalls in performance; glasses with metallic glasses, which absorb electromagnetic radiation.[37]

Control

Used equipment PZ-9; PZ-10 for 300 MHz-300 GHz. The measurement is made in the area of finding personnel at 2 m 3 levels: 0.5, 1, 1.5 m. The whole room is partitioned into grid with a pitch of 1 m and the measurement occurs at the points of intersection with the radiation power max.

Accident prevention

Hazardous Area Equipment

Danger zone - a space in which the possible effects on operating dangerous or VPF.

The danger is localized around moving machine parts, cutting tools, gear and other gears, conveyors, hoisting machines and mechanisms.

The presence of the danger zone causes the possibility of injury e. current to thermal, electromagnetic, ionizing radiation, ultrasound.

Dimensions of the danger zone may be constant (between the belt and pulley) and variables. In the design of the equipment is provided or no human contact with OZ or availability of remedies.

Remedies:

- Collective - signaling

- Remote control systems

- Individual

- On the principle of action

- Fencing

- Blocking

Blocking (blocking) - exclude the possibility of man's entry into the danger zone, or eliminate PF to stay human in the area. This type of protection is used where the work can be carried out to remove or open the guard. By the principle of action of the locking devices are divided into mechanical, electrical, photovoltaic, radiation, hydraulic, pneumatic.

Mechanical lock - a system that provides the connection between the fences and the brake (launchers) devices. When the guard removed the equipment can not be started in the job. So dangerous are blocked entrances to the premises where people stay forbidden.

Electric lock - used in electrical equipment with a voltage of 500 volts or higher. Provides switch equipment only with fences on the principle of limit switches.

Photovoltaic blocking - based on the principle fence the danger zone light beams.

Radiation blocking - based sensors and radiation detectors.

Protective device

Prevents the appearance of a person in the danger zone. They are used for insulation systems, drive cars, processing zones, fencing systems and the live bands of radiation barrier at the height of the working area. Constructive solution depends on the type of fencing equipment.

Safety devices

To automatically disconnect units and machines at the exit of any equipment parameters of range, which excludes emergency mode. For installations under pressure - a safety valve and membrane uzlyl; thermal relays, water constipation - to prevent explosions compressors; travel stops, weight; braking systems; weak links (shear tabs; clutches that do not transmit motion at high torque).[38]

Signaling device

Provide information about the work of the process equipment, as well as about the dangers and harmful factors, which in this case arise. By appointment divided into three groups:

- Operational security
- warning
- Identification

By way of transmission:

- Sound (sirens)
- Combined
- Visual (by smell)
- Odarizatsionnaya (smell)

For visual use artificial light sources: placards, color painting, check boxes (manual).

RAM is used during the tests on the stands automatically.

Warning - signs, posters, a system of signs (prohibiting warning - yellow).

Remote Control Systems

Characterized in that the control and management of the equipment is carried out from the areas remote from the danger zone.

Monitoring is performed either visually or by telemetry.

The parameters of the equipment received from sensors on the center console. DU is used in workshops with explosive and flammable materials, toxic substances.

3.2. Working conditions: the concept, the determining factors
Assessment of working conditions

In modern conditions of market economy in our country has placed new demands on the organization of work in the enterprise. In this regard, an important issue is the establishment of effective working conditions. Therefore, in practice, work on the scientific management to improve working conditions consumes about one quarter of all planned expenses.[39]

Of great importance to improve working conditions is due to the fact that they are basically working environment in which human activity occurs during labor. Their status is in direct proportion to the level of human performance, the results of his work, health, attitude to work. Improving working conditions significantly affect the increase in its productivity. Therefore, in practice, the cost of implementing them pay off an average of 3 - 5 years.

Performing any work for a long time the body is accompanied by fatigue, manifested in the reduction of human health. Along with the physical and mental work a significant impact on fatigue and provides the surrounding work environment, i.e. the conditions in which it takes work.

Based on the foregoing, it is possible to determine the purpose of the course work - the study of the basic directions of improvement of working conditions and the determination of their economic efficiency.

To achieve this goal it is necessary to perform a number of tasks: 1) to give a definition of the concept of working conditions; 2) Describe the factors determining the conditions of work; 3) consider the main methods of assessment of

working conditions; 4) to analyze the main directions of improvement of working conditions; 5) to consider the mechanism of calculating the cost-effectiveness of measures to improve working conditions.

Course work consists of two chapters: the first chapter contains theoretical information about working conditions, their elements; The second chapter is devoted to methods and ways to improve working conditions.

What is working conditions?

Working conditions- a combination of environment factors influencing the functional state of the body work, their health and performance at work. They are determined using equipment, technology, objects and products of labor, the system of protection of workers, service jobs and external factors which depend on the state of the production facilities that create a certain climate. Thus, based on the nature of the work, the working conditions are specific for each production plant and site, and for each workstation.

Working conditions- is a complex objective social phenomenon emerging in the labor process under the influence of inter-related factors of socio-economic, technical and organizational nature and natural character and influence health, human performance, his attitude to work and the degree of job satisfaction, the effectiveness of labor and other economic results of production, the level of life and comprehensive development of man as the main productive forces of society.

This definition gives a complete description of the working conditions: their essence as an objective phenomenon, the formation mechanism and guidelines on influence working person, effectiveness, impact on social development. This definition concretizeterm "work environment" and "conditions work" represents the unity of the two sides. On the one hand, the factors affecting generation working conditions, and on the other – elements,making up working conditions. The elements concern working conditions, such as temperature, gas content, and so on. E., That is, everything that directly affects the working man, his health, performance and social development.

Factors determining working conditions

According to the authors of works of VP Pashuto and VV Adamchuck , the factors shaping the working conditions can be divided into the following groups:

The production, among which are:psychophysiological,sanitation,aesthetic;

Production factors - is the most extensive group of factors leading features of this specific form of production and working conditions. Among them are several sub-groups: physiological, hygienic, aesthetic, and some other (Household, organizational, material and so on.).[40]

Psychophysiological factors due to the content of labor and its organization, so they are sometimes called labor. They may also be called technical-technological, t. To. They are determined by the peculiarities of used machinery and technology, the level of mechanization and automation of labor, equipment degree jobs, especially raw materials. It - physical activity, which is associated with dynamic and static operation; neuro-psychic load in the form of voltage (accuracy), neuro-emotional stress and intellectual load (the amount of information processed, the number of one-off production of important objects of observation, etc.); the monotony of the work process (diversity, the pace of labor). The elements of this group, with the exception of physical effort and monotony do not have the approved standards.

Currently, there are several psychophysiological approaches to integrated assessment of the working conditions.

Job analysis approach is to study the content of the labor process, and the result of the work of the unit is based on the estimation of the overall working conditions.

Another approach involves the classification of working conditions on the severity and intensity on the basis of physiological and psycho-physiological parameters, dynamics and fatigue performance, reflected in one way or another body's response to the workload and working conditions.

The severity of labor – characteristicsofthelaborprocess, reflectingthestrainonthemusculoskeletalsystemandfunctionalsystems (cardiovascular, respiratory, etc.) to ensure its activities.

Consider the classification of the severity of labor. According to the medical and physiological skills developed Institute of Labor on the basis of these criteria can wash all work is divided into six categories of severity.

The first category of severity (light) - is the work performed under optimal environmental conditions and the optimum value of physical and mental stress. The reaction of the body indicates the normal functioning optimally, i.e. workload corresponds to the physiological features of the body. Such conditions in healthy people contribute to the improvement of health, achieving high efficiency and productivity.

The second group includes *work of gravity*, in which the normal functional state is not reduced during the work shift. Maximum allowable concentrations and an additional level of harmful and dangerous production factors does not exceed the requirements of normative-technical documents. Efficiency is not broken, do not have occupational diseases.

The third category includes *the severity of operation* in which the result of increased stress or poor working conditions formed reaction of the body to the point of pathological, ie, reaction inherent premorbid state of the organism. Rest or better working conditions can quickly eliminate the negative effects.

When *the fourth category of gravity works* in healthy people formed deeper borderline states, physical indicators deteriorate arise due to production status before the disease.

Thefifth category included the work in which due to the poor working conditions in healthy people at the end of the period of reaction formed, characteristic of pathological functional state of the organism. After a good rest, these states may disappear. However, some people may go into production due to occupational disease.

The sixth category is characterized by *theseverity of the particularly unfavorable conditions.* Pathological reactions occur rapidly and are irreversible, accompanied by serious violations of the vital organs.

Hygiene factors - is, roughly speaking, the foreign work environment, namely climate (temperature, relative humidity, air velocity), the purity of air quality (presence of vapors, gases, aerosols), lighting, noise, vibration, ultrasound, various radiation, and other biological effects. Almost all of them are normalized by setting standards, sanitary standards and requirements and quantitatively evaluated using the methods of sanitary research.

Numerous studies hygienists and physiologists work found that the human body have a significant impact hygienic working environment factors. Some of them have an adverse effect on the employee, which reduces efficiency, impairs health and sometimes leads to occupational diseases. Therefore it is necessary to know not only the cause of these factors, but also to have an idea about how to reduce their negative impact on the body work. Particular attention should be paid to the influence of adaptive environmental factors (weather conditions, noise, vibration, light), the negative impact of which can be greatly reduced through the use of active means of improving the work process.

Aesthetic - these are the **factors**, the impact of which can cause a person corresponding to the conditions of labor in terms of artistic perception of the environment (meaning the use of color, form, music in the work of man). These elements are used in decision-art design quality of jobs, tools, work clothes, aids, as well as in architectural and interior design. An important element in modern conditions are functional music and painting production facilities. Their use is a positive impact on the work of artist and contributes to its performance.

Quantitative estimates of the elements of this group do not have. Determination aesthetic level of working conditions by using peer review methods.

Socio-psychological

Socio-psychological group of factors determined by the composition and characteristics of the company (the socio-demographic composition of the staff, the

interests of employees, management style in the company offices, etc..). Under the influence of these factors formed the moral and psychological climate in the enterprise, manifested in the level of staff stability, its cohesion, the nature of relationships between groups of workers, the mood, the discipline of labor, labor activity and creative initiative. Social and psychological factors do not yet have the units, norms and standards. But the case studies in the form of oral questioning, questioning creating an objective basis for the creation of their measurement and evaluation.

The main directions of assessment of working conditions

Each of the factors considered, especially sanitation and psycho-physiological, have an impact on the health and performance of the worker. If some of them act simultaneously, they reinforce the overall impact on the person. Medico-physiological studies established the maximum allowable values for each of the factors under which they do not adversely affect the health worker. Knowing these limits and objectively determine the actual value of specific values at the workplace factors that can be targeted to carry out actions to improve working conditions.

Since the manufacturing conditions of work are considered from the point of view of their impact on the body running, an assessment of their actual state should be based on the effects of such an impact on human health. It is very important to take into account the diversity of factors that shape working conditions.

The main directions of assessment of working conditions

Above the classification of work has been presented in severity. To assess the state of psycho-physiological functions working techniques are used, aimed at measuring muscle strength and endurance, speed receipt and processing of information, the response time to visual stimulus.

On the performance is greatly influenced by such factors as the vibration of the working environment. When studying the effect of vibration on the human body should first consider the oscillation frequency. The typical relationship

between the oscillation frequency of the vibration and the occurrence of diseases listed in Annex 2.

From the application data 2 that the development of vibration disease occurs to a lower limit of the oscillation frequency of 35 Hz and the upper - 25 Hz. When vibration disease decreases the sharpness of touch, tactile, thermal and pain sensitivity. The most pronounced symptoms of the disease - a negative change of the blood vessels.

Evaluating a hygienic factor as workstation lighting, are taken into account the following features. When you create optimal conditions for the activity of the visual analyzer, please note that effectiveness depends not only on the lighting but also on such important functions of the eye, as a reference sensitivity, visual acuity, speed and stability of the parts distinguishing clear vision. It is known that the maximum contrast sensitivity (the ability to distinguish between the brightness of the eyes of the painted surface) provided the background brightness in the range of 100 - 3,200 cd / m2. Outside these values, it goes down. In contrast sensitivity affect size inspects surfaces.

In a production environment it is very important to distinguish the details as soon as possible. The speed of visual perception increases as the lighting. It increases rapidly when illuminated in Luke 70-75. Slower - while covering 1000-1200 to Luke and more. A clear perception of the subject eye retains a certain time. Calm eyes to keep a clear image of the part in question, i.e., a clear vision of sustainability, expressed in terms of time of clear vision to the total time the part in question. Sustainability clear vision depends on the nature of the work performed, the conditions of the working environment, in particular on the duration of illumination (with improved lighting dramatically increases the length of clear vision).At the same voltage resistance of a clear vision with less intense visual work will be higher than the more strenuous.

3.3. Ecological monitoring

Quality information on ecosystem rank and trends is vigorous to uphold a healthy, maintainable environment and economy.

Ecological monitoring spawns the information necessary to measure and respond to ecosystem deviations. Monitoring can support with the documentation of new environmental worries, the ordering of issues, and the assessment of trends over time.

This information can be used to mature appropriate strategies to alleviate, adapt and reply to environmental burdens and to modify programs and policies to see environmental challenges. Long-term, multidisciplinary exploration and monitoring delivers decision-makers with chiefly valuable information.

From 1994 to 2010, the Ecological Monitoring and Assessment Network (EMAN) was recognized as a national network of establishments complicated in ecological monitoring in Canada to better notice, describe, and bang on ecosystem deviations. The network was made up of government and nongovernment organizations, academic institutions, native organizations and public groups. EMAN CO, in corporation with Nature Canada and Provincial and Territorial Coordinators, initiated NatureWatch, a national citizen science monitoring program.

The Network was managed by the EMAN Coordinating Office of Environment Canada. Key products of the EMAN network were:

Ecological Monitoring Protocols

Working with its associates - formerly under the Ecological Monitoring and Assessment Network- Environment Canada sanctions standard protocols and matures them in areas where either alliance is required, or no work has been done. The expansion of protocols is done through discussion with scientists, researchers, and experts.

Monitoring protocols permit for standardization in study strategy, sampling procedures, taster and data analysis, and reportage methods. This safeguards that

information gathered in Canada is useful for problems analysis and ecological accepting at the local, national and international scale.

PROGRAMME OF THE ECOLOGICAL MOVEMENT OF UZBEKISTAN

Since independence, Uzbekistan has reliably been applying a strategy for large-scale productive socio-political and socio-economic transformations meant at achieving: peace in the country, affluence in the homeland, well-being of the people.

The socially oriented market economy, state and public building system of independent Uzbekistan are evolving with dynamism. Successive application of socio-economic reforms, solid social policy has resulted in a balanced growth in actual incomes and wealth of the population. Systems of education and preparation, personnel teaching, health protection, and culture that are unique in constituent and content have been twisted. A new age band of people, independently and modernly thoughtful personnel of new foundation who are brought up on national and panhuman standards and able to really contrivance large-scale tasks for transformation of the country and production of modern democratic society, people with a profound sense of their obligation for the present and future of the country, responsibility for destiny of their native country are inflowing into life.

Thereupon nowadays founding of Ecological Movement of Uzbekistan has become an adamant demand of time. The Ecological Movement purposes to unite population of the country who maintenance ideas and want to dynamically contribute in environmental and community health protection, and are influenced that an environmentally directed attitude to carrying out of political, economic and social modifications is the most actual way for maintainable development in Uzbekistan.

The Ecological Movement pursues to mobilize all services of society for further extending of modifications carried out in the country, which are meant at implementation and harsh observance of the rights of present and future generations of population in Uzbekistan to living in a encouraging environment,

development of public health, defense and rational use of all the compound of natural resources.Considering "Healthy Environment – Healthy Human" as its main dictum, the Ecological Movement sets the following program responsibilities for its implementation.

I. All-round rise of public contribution activity in environmental protection and improvement.The most consideration of the Ecological Movement will be absorbed on that environmental protection would develop a business of every citizen of the country.

II. Carrying out of complete work to confirm implementation of already accepted laws and other national documents on environmental protection, and support to further excellence and advance of the legislation in this field.

The dominant duty of the Ecological Movement will be to deliver broad public succor and provision for work of state forms, environmental organizations, all initiatives and institutions on enactment of laws in force and extra government decisions regarding environmental protection, development of water and air, land and biological resources and their fortification from harmful inspiration of waste, and public health care.

At the same time, the Ecological Movement will recruit adoption of new legal acts by legislative and exclusive authorities, change of laws in force and other regulatory legal acts in order to progress legal regulation of solving the existing ecological and environmental evils, further expansion of the environmental legislation and legislation regarding public health conferring to the generally putative rules of international law and the international agreements with the Republic of Uzbekistan.

III. Rising of the responsibility of chief and local authorities, civic and other structures for performing adopted official papers on environmental protection and confirming rational use of incomes owed to these resolutions The Ecological Movement will support in every potential way to raise the responsibility of central and local authorities, different public and other organizations for unconditional enactment of laws and supplementary

governmental decisions regarding environmental protection, rational use of usual resources and resources directed to these aims. To this end, it will advance cooperation with followers of the Senate of the OliyMajlis (upper chamber of Parliament) and deputies of the Legislative Chamber of the OliyMajlis (lower chamber of Parliament) of the Republic of Uzbekistan, deputies of local Kengashs (Councils), self-government civil institutions, public organizations, other civil society institutions and the mass media.At that, exceptional attention will be focused on floating the responsibility of officials of central and local authorities, readiness, organizations and institutions for obedience with laws and other government resolutions:

- on protected natural zones and entities, environmental certification and capability, on waste administration and on environmental supplies in production activities;

- on water and water use, on land, on mineral resources, on atmospheric air protection, on protection and use of forests, flora and fauna.

The Ecological Movement will also effort its efforts on execution of systematic public environmental monitoring over completing of priority environmental speculation projects at local level, well-timed and complete distribution and rational use of funds apportioned from the State budget to these purposes, and direct foreign investment and credits, sponsor funds.

IV. Raising of ecological culture of the population, development of the system for ecological education and training.

The Ecological Movement of Uzbekistan trusts that solving of environmental evils being gradually global today goes elsewhere overview of resource-saving and environmentally fitting technologies in economic activities, employment of environmental protection movements and perfection of the legislation in this arena.Today events to raise ecological culture of the population, form a sense of civil liability of everybody for a solicitous boldness to the environment, marmalade the unique nature of the country for future generations are increasingly becoming a key factor for environmental advance and prevention of negative techno genic and

anthropogenic influence on the environment.To increase environmental awareness of the population, the Ecological Movement means to take an dynamic part in the application of governmental programs directed at:

- growth and implementation of a program for unceasing ecological education and education for supportable development;

- creation of an actual system for advanced training of authorities in ecology as well as rising ecological education of CEOs and experts in various spheres of production, economy and administration, law-enforcement and judicial bodies.

To solve challenges to raise ecological culture of the population, the Ecological Movement considers it is important to appeal to cultural heritage of the people that always aspired to establish harmonious mutual relations between human and nature, and conserve it for future generations, as well as to centuries-old national traditions and values of careful attitude to water.

The Ecological Movement sets its important program task to popularize environmental outlook, rational approach and careful attitude to the environment, in any spheres of life of society, and will fulfill this task in close cooperation with other civil society institutions.

The Ecological Movement intends to provide broad public support for promotion of scientific studies in environmental protection, advancement of resource-saving, energy-efficient and environmentally appropriate technologies, and considers that funds invested today in education and science constitute a capital that provides a strong base for forming in the country high-intellectual society with high ecological culture, to which the future belongs.

V. Promotion of international cooperation in environmental protection

Keeping in mind that environmental protection has no borders, the Ecological Movement will consistently develop and strengthen communications with international and foreign environmental public organizations. Attaching great significance to that Uzbekistan has joined key environmental documents of international law such as the UN Conventions to combat desertification, on biodiversity, on climate change, on transboundary water use,

etc., the Ecological Movement will seek to contribute to further promotion of effective international cooperation for environmental protection and sustainable development.

For these purposes, the Ecological Movement will provide active public support and assistance for:

- effective participation of representatives from Uzbekistan in international environmental forums;

- improvement of practice for holding bilateral and multilateral international conferences, workshops and meetings on environmental problems.

Considering that ensuring environmental security in Central Asia has not only a direct bearing on life and destiny of peoples living here, but is also of global significance, and solving such problems as the Aral Sea desiccation, climate change, land degradation, water shortage and pollution, biodiversity reduction, and trans boundary pollution transport goes beyond the interests of the states taken separately and dictates necessity to solve them together, the Ecological Movement supports in every possible way and intends to take an active part in international projects aimed at:

- consolidating international efforts to solve these and other acute environmental problems and issues of human dimension;

- giving an environmental orientation to modernization and development of production in the region;

- supporting environmental initiatives aimed at application of environmentally appropriate technologies, bio- and nanotechnologies, environmental innovations in production;

- attracting international financial institutions in investment and crediting for priority programs and projects in the field of environmental protection, improvement of ecological situation and environmental sanitation education and training, and health protection.

Conclusion

A practical result of this final qualifying work was the development of an electronic course of practical lessons on discipline "Technology of creation of educational multimedia applications in Adobe Flash" using the software Articulate Storyline. The developed materials can be used in the practice of teachers technology in the classroom.

Nowadays education system, the stage can be compared with the era that followed the emergence of the printing press. As you know, this has led to the abandonment of the system in which the teacher literally read his lectures, and students recorded them word for word and then memorized. Under this system, students receive copies of textbooks, which they can do in class and at home. Similarly, now a revolutionary change in the current learning technology in the education system designed to perform computing. Computers must inevitably lead to a change in current teaching technologies in schools, colleges and Universities, the introduction of computers in all spheres of human activities – the revaluation of certain knowledge.

The main purpose of computers in education is the number of tasks directly related to information accumulation, the search processing), the introduction of ETC, allowing students to acquire the knowledge they need. Many data, knowledge of which is now considered essential for a professionally trained person, can, if necessary, to obtain on the monitor screen.

Almost all technology lessons students need to develop practical skills. But not all teachers give this issue meaning. Thesis systematized and grouped basic and necessary knowledge on the methods of teaching technology: the correct use of tools, Adobe Flash, perform sketches and technical drawings to convey shape, size. Knowledge, abilities and skills acquired, the lessons provide initial information about the program Adobe Flash. A teacher must be able to correctly present the material relating to this industry. The aim of the thesis achieved, the tasks carried out and the hypothesis is confirmed.

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