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SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

Guidelines to the comprehensive training

for Master's second degree higher education students of speciality 186 "Publishing and Printing" of the educational program "Technologies of Electronic Multimedia Publications"

Kharkiv
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The structure and content of four trainings, as well as guidelines to them, are included. Within the framework of each training, its purpose, tasks, input data, competences provided by the training, description of the training stages, didactic methods and techniques used during the training, description of the training results are given.

For Master's second degree higher education students of speciality 186 "Publishing and Printing" of the educational program "Technologies of Electronic Multimedia Publications".

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Introduction

Training is a pre-planned process, the purpose of which is to change the attitudes, knowledge or behavior of participants through a learning experience, and develop skills in performing a specific activity or several types of activities.

This is a special form of learning that is based on real rather than declarative knowledge, and it gives the opportunity to experience firsthand what the lecture is about in general. Real knowledge is knowledge of one's own experience, not information. It is better for a training participant to do something wrong by himself one time than to see others do it right countless times. The very concept of experience is common and key to understanding the training.

The training is aimed at teaching action technologies based on a certain concept of reality in an interactive form.

Within the framework of these guidelines, four trainings are given, structured according to the following components:

the purpose and tasks of the training;

the input data for training (i. e. the theoretical, instrumental and material base);

the competences that the training will help to acquire and develop;

the structure and description of the content of the training stages;

the didactic methods and techniques that will be used during the training;

the description and the form of presentation of the training result.

Education in the form of training is a pre-final stage in the framework of training students at the second (master's) level and a logical basis for further completion of pre-diploma practice and preparation and defense of an attestation work (in the form of a diploma thesis). The training provides an opportunity for self-development of students within the framework of competence components regarding the solution of research, analytical, diagnostic, heuristic, etc. tasks. It produces skills that expand the theoretical and practical training of specialists in speciality 186 "Publishing and Printing".

The results of the training and the competences formed by the complex training are shown in Table 1.

Table 1

The learning outcomes and competences formed by the complex training

The results of training	Competences that must be mastered by students
LO1	GC3, SC3
LO2	GC3, GC6, SC3
LO3	GC6, SC1, SC3
LO4	GC1, GC3, GC6, SC6
LO5	GC1, GC5, SC6, SC8
LO6	GC5, SC1, SC3, SC4, SC6
LO7	GC5, SC1, SC3, SC4, SC8
LO8	GC1, GC5, GC6, SC3, SC5
LO9	GC2, GC3, GC5, SC7, SC8
LO11	GC1, GC4, GC8, SC7
LO12	GC5
LO13	GC3
LO14	GC1, GC6, GC8
LO16	SC10

The results of the training:

LO1. Responsibility for the development of professional knowledge and practices, evaluation of the strategic development of a team, formation of an effective personnel policy.

LO2. The ability to evaluate prospects, create scientifically and technically sound research forecasts and carry out conceptual and substantive modeling of trends in the development of the industry.

LO3. The ability to make effective decisions on issues of publishing and printing, including those in difficult and unpredictable conditions; predict their development and market conditions; determine the factors affecting the achievement of the set goals, in particular, consumer requirements; analyze and compare alternatives; assess risks and likely consequences of decisions.

LO4. The ability to communicate freely orally and in writing in Ukrainian and one of the foreign languages (English, German, Italian, French, Spanish) when discussing professional issues, research and innovations in the field of publishing and printing and related problems.

LO5. The ability to develop and implement projects of publishing and printing industries and systems of their engineering and technical support, taking into account engineering, legal, economic, ecological and social aspects, to carry out their informational and methodical support.

LO6. The ability to manage complex activities in the field of publishing and polygraphy, to organize and improve publishing activities of printing factories, develop plans and measures for implementation of plans, ensure quality and calculate technical and economic efficiency production.

LO7. The ability to carry out computer design of individual components of the technological process.

LO8 The ability to develop and implement effective technologies, develop instructions and technological regulations for the production of publishing and printing products.

LO9. The ability to conduct research and/or carry out innovative activities in order to obtain new knowledge and create new technologies and products in the field of publishing and printing and in wider multidisciplinary contexts.

LO11. The ability to apply modern experimental and mathematical methods, information technologies and specialized software for research and development in the field of publishing and printing.

LO12. The ability to search for necessary data in scientific literature, databases and other sources, analyze and evaluate these data.

LO13. The ability to use in practical activities the knowledge of domestic and international legislation on the protection and preservation of copyright in production of printed and electronic publications, packaging, multimedia information products and other types of publishing and printing products.

LO14. The ability to analyze, discuss and determine the most appropriate decision regarding the design and applied implementation of the process of development of printed and multimedia products.

LO16. The ability to use specialized software to create a multimedia publication and process its individual components (video, audio, animation, etc.).

The following competences are formed:

GC1.The ability to apply knowledge in practical situations.

GC2. The ability to generate new ideas (creativity).

GC3. The ability to communicate in a foreign language.

GC4. The ability to search, process and analyze information from various sources.

GC5. The ability to develop projects and manage them.

GC6. The ability to make informed decisions.

GC8. The ability of abstract thinking, analysis and synthesis.

SC1. The ability to comprehensively assess the influence of the environment of the functioning of technological and production processes on the improvement of product parameters.

SC3. The ability to determine the main functions and areas of improvement of production support, to develop measures for operational and prospective management, forecasting and planning of production.

SC4. The ability to organize the operation of technical and software means of publishing processing of information and materials, to analyze and evaluate the possibilities of adapting technological complexes for effective use during the preparation of all types of publishing and printing products in a specific production system.

SC5. The ability to develop and implement new technological processes, in particular resource- and energy-saving technologies, and types of products in the field of publishing and printing, to optimize production processes in accordance with the requirements.

SC6. The ability to organize activities and effectively manage institutions/ units in the field of publishing and printing.

SC7. The ability to apply modern methods and tools for research in the field of publishing and printing, as well as provision of product quality.

SC8. The ability to develop and implement scientific and applied projects in the field of publishing and printing and related interdisciplinary areas, taking into account technical, economic, social, legal and environmental aspects.

SC10. The ability to organize the production of an electronic multimedia publication.

1. Training "Management of a multimedia publishing house project team"

The general purpose of the training is to form competences in the management of the project team of a multimedia publishing house.

The target audience is students of master's programs in speciality 186 "Publishing and Printing", managers and specialists of multimedia publishing houses.

The goals of the training are:

1) to realize (understand) what effective project team management is;

2) to understand the peculiarities of multimedia publishing (MMP) project teams;

3) to learn project team organization technologies;

4) to acquire the ability to manage the process of formation of an effective working team;

5) to master the technology of distribution of roles of project team members.

The tasks of the training (the main program blocks of the training) are:

1) effective management of a project team;

2) features of MMP project teams;

3) technologies of a project team organization;

4) the process of effective team work;

5) distribution of roles of project team members.

The competences that the training will help you to acquire and develop are:

the ability to collectively form the rules of interaction in training;

skills in creating a common vision and action plan;

the ability to formulate the mission and goals of the project group, to determine the criteria for evaluating the results of project activities;

knowledge of the requirements concerning competences and responsibilities of the main categories of specialists in the structure of a project management team;

the ability to form a list of technological roles of persons participating in the creation of multimedia products;

selection of project team members based on the table of the required skills;

the ability to conduct surveys on the effectiveness of the team's activities and discuss the obtained results in the team;

the ability to form a team spirit and a team contract;

mastery of techniques for stimulation of creative thinking in teamwork;

understanding that there are roles and levels of responsibility;

the ability to form a matrix of conformity of production and personal roles of project teams;

the ability to set priorities and optimize the human resources used;

management of team processes – stimulation of innovative thinking;

skills in involving employees in project work;

working with the resources of one's own leadership style;

mastering new methods of managing project teams.

The input data for training are:

the theoretical base (for successful completion of the training, students must possess knowledge and skills in technologies for creating and processing – various types of multimedia information, creating multimedia publications – websites, presentations, etc.);

the tool base (the required software: Microsoft Office, programs for building memory cards);

the material base (a flipchart, paper, colored markers, computers, a multimedia projector, a screen).

The training is designed for two days (from 10:00 a. m. to 6:00 p. m.).

The training plan is given in Table 2.

All participants receive handouts on the topics of the training.

Table 2

The training plan

Duration	Training module	Content of the module	Work methods	Results of the module for participants
1	2	3	4	5
Day 1				
1 hour 30 minutes	Acquaintance	Introductory speech of the coach. The acquaintance procedure. Forming a list of expectations and requests for participants. Formation of interaction rules in the training. Approval of the work schedule	Dialogues. Minipresentations of participants. Brain storm	Participants and the trainer get to know each other. Jointly formulated rules of interaction in the training. Agreed and specified goals and tasks of the training participants. A mood for constructive joint work was formed
15 min	Coffee break			
1 hour 15 minutes	1. Effective management of the project team	Concepts and distinguishing features of the project, programs, portfolio of projects. Stages of team creation and development. Tasks that are solved at different stages. Formation of ideas about teamwork	Minilecture. Problematization. Brain storm. Work in subgroups. Subgroup presentations. Discussions	The key elements and factors of the multimedia publication project have been determined. Knowledge about the stages of team creation and development has been formed. False and true ideas about teamwork are defined
1 hour	Lunch break			
1 hour 30 minutes	1. Effective management of the project team	Mission and goals of the project group. Criteria for evaluating project activity results	Moderation based on brainstorming or mind-mapping. Discussions	A formulated mission. Lists of goals of the project group have been compiled. The criteria for evaluating the results of project activities have been defined

Table 2 (continuation)

1	2	3	4	5
15 min	Coffee break			
1 hour 30 minutes	2. Project features of a MMP teams	Composition of the studio. Composition of the web design studio. The main motives of the project participants. Division of labor in the project team	Moderation based on brainstorming or mind-mapping. Discussions	A list of works (activities) of the web design studio. The composition of the multimedia project development team. Requirements for the competences of specialists
Day 2				
1 hour 30 minutes	3. Technologies of project team organization	Organizational structures in projects. The main participants of the project activities, their interaction and role in project implementation. Distribution of tasks and responsibilities between project participants	Brain storm. Discussions	The composition of project management team and responsibilities. A list of technological roles of persons participating in the general case in the creation of multimedia products. Selection of project team members based on the table of required skills
15 min	Coffee break			
30 min	3. Technologies of project team organization	Formation and motivation of the project team	A short story about the essence and importance of motivation. Business game "Motivation"	A list of motivational tools has been compiled

Table 2 (continuation)

1	2	3	4	5
45 min	4. The process of effective team work	4.1. The concept of an effective team and its difference from a work group	A minilecture. A questionnaire on team effectiveness. Discussion of the results is moderated by the trainer	Completed questionnaires. A collective view of the project team has been compiled
1 hour	Lunch break			
1 hour 30 minutes	4. The process of effective team work	4.2. Task: acquaintance and mutual study of team members	Exercises: "Propositions", "Brownian motion", "Carousel". Role-playing games "Trust training"	Formation of team spirit. Unity of training participants
1 hour 30 minutes	–	4.3. Achievement of joint organized activity based on the project discipline and procedures	A minilecture. Brain storm	Team contract
30 min	–	4.4. The process of establishing effective team work, stimulating innovative thinking	Minicases in groups of 2 participants (tasks for problem situations). Moderation of the discussion	Techniques for activating creative thinking in teamwork have been mastered
15 min	Coffee break			
30 min	5. Distribution of roles of project team members	5.1. Formation of roles and levels of responsibility	A minilecture. Role-playing games ("Difficult" clients. Role rotation. Role exchange. A group portrait)	Understanding that there are roles and levels of responsibility

Table 2 (the end)

1	2	3	4	5
30 min	–	5.2. How roles and levels of responsibility are formed	A minilecture. An attachment test. Discussion of the results	Participants receive their own role profile
30 min	–	5.3. Distribution of roles and positions in the team for effective achievement of the result of the project group	A minilecture. An exercise for filling out the matrix of technological roles	The matrix of conformity of production and personal close roles of project teams
30 min	–	5.4. Presentation of roles and responsibilities and their effectiveness	Test "Assessment of team effectiveness"	Review of team effectiveness assessment results
30 min	Summary of the training	–	Exercise "How was the training?"	–

The structure and description of the content of tasks, games, problem situations of the training, which will be given to students

1.1. Exercise "Meeting and my expectations from the training"

Methods: individual work, brainstorming.

The trainer (assistant) distributes sheets of whatman to all participants, offers to take felt-tip pens and write answers to the questions.

The trainer writes instructions on a flipchart (Table 3).

Table 3

The content of the instructions and the procedure for performing the exercise

Instruction	Procedure for performing the exercise
1. Name. 2. A symbol of your personality/metaphor. 3. I love... 4. Success for me is... 5. Experience of participation in trainings. 6. Your expectations…	1. Whatman sheets, where they write (draw metaphorical images) answers to the questions, 5 minutes. 2. Presentation of each participant, 3 minutes. 3. Group members put questions to the colleague who is speaking

Training participants make minipresentations on their posters.

1.2. Problematization

(The work process is being videotaped).

The group is divided into two project teams.

Each team receives:

a short technical task for the development of a multimedia publication (a website);

tasks of role groups in the concept development phase;

tasks of role groups in the planning phase;

a list of tasks of the concept development phase;

a list of tasks of the planning phase of the project.

The number of sets of handouts corresponds to the number of training participants. The tasks of the role group are given on separate sheets so that each participant can choose the role that suits him.

Tasks for project teams.

Select the customer and remove this team member from the project.

Team members should be divided into role groups.

Get a technical assignment from the coach.

The concept of the development phase.

Familiarize yourself with the technical task (TOR) and develop a unified vision (shared vision).

Prepare the following documents:

• a document of general description (vision);

• a project framework document (a scope document);

• a risk assessment document.

The planning phase.

The project team should analyze and document four general categories of project requirements:

• business requirements;

• consumer requirements;

• operational requirements;

• system requirements related to the solution in general.

Prepare the following documents:

• a communication plan;

• a consolidated calendar schedule of the project, budget;

• a development estimate;

• a training plan;

• a schedule of usability testing;

• testing requirements; a plan and a calendar schedule of testing;

• operational requirements; a plan and a calendar schedule of pilot and final implementation;

• a functional specification of the multimedia publication (website) project.

The project teams present the results of the first two phases of the project, at least what they have managed to do.

Note. In the process of work, the project team is allowed to hold meetings with the customer, prepare a brief, prepare questionnaires for the customer, conduct questionnaires (the customer fills out the questionnaire on behalf of the company).

1.3. Exercise "A Mechanical sculpture"

Instructions to the participants: "Imagine that each of you is a sculptor. You have received an order to make a sculpture of your team. The material for the sculpture is all your colleagues. But the sculpture should not be just a stationary memorial or a monument. You need to do something like a music box with moving figures. Remember what it looks like. The lid opens, music plays, and we see the figures moving: couples circling in a dance, gentlemen bowing and handing handkerchiefs to ladies waving with fans... They order something similar for you, only they ask that the plot played out by the figurines reflects how you see the main features of interaction in your team."

The assistant coach takes pictures of the sculptures.

Teams are invited to write down problems in their work, interaction, task performance on whatman. The method is brainstorming (10 minutes).

Watching the video and discussing the problems identified by the teams and the trainer, as well as possible potential problems, if they were not revealed in the course of the problematization exercises.

1.4. Exercise "Competences of the project team"

Participants form four microteams and each microteam makes a list of competences of the MIC project team (for positions according to the table).

The composition of a multimedia studio (a web design studio).

A possible list of persons participating in the general case in the creation of multimedia products (technological roles):

- executive producer;
- producer;
- production assistant;
- creative director;
- interactive designer;
- instructional designer;
- industrial designer;
- project manager;
- copywriter/editor;
- content specialist;
- researcher;
- artistic director;

- graphic designer;
- sound engineer;
- TV crew;
- photographer;
- file transfer/network manager;
- programmer multimedia;
- developer scenario;
- animator (2D/3D);
- sound composer;
- composer;
- director of photography;
- programmer HTML;
- lawyer/a specialist in the acquisition of rights for media products;
- illustration artist;
- bannermaker;
- tester.

1.5. Distribution of tasks and responsibilities between project participants

In order to assemble a team, it is necessary to determine who is needed for the project and what each team member should be able to do.

Table 4 shows the form for the relationship between the necessary skills of specialists and the involved project participants.

Table 4

A table of the required skills (a fragment)

The required specialist skills	Specialist 1 full name	Specialist 2 full name	. . .	Specialist full name
1	2	3	4	5
Creating a product vision	+	+		+
. . .	. . .	. . .	. . .	. . .
Forming team motivation	+			+
. . .	. . .	. . .	. . .	. . .
Creating a content structure for the project		+		
. . .	. . .	. . .	. . .	. . .

Table 4 (the end)

1	2	3	4	5
Collecting information from project content experts		+		+
. . .	. . .	. . .	. . .	. . .
Transferring the recorded material to the computer	+		+	
. . .	. . .	. . .	. . .	. . .

1.6. Business game "Motivation"

Blank sheets of paper are distributed to all participants and a list of problems or situations in management activities is read out. Before this, the instruction is given: "We will read you a list of the most typical situations that can cause difficulties in your management activities. Your task is to rank them in this way: number 1 will be the most difficult situation for you personally, and you would like to learn to cope with such situations first of all. Under the number 16, put a situation or a problem that is not difficult for you and you easily cope with it. Everyone works individually without discussion with other participants. 10 – 15 minutes are given to complete the task."

The second stage of the business game is preceded by the instruction: "You have ranked the proposed topics, problems for our further work, based on the individual experience of everyone. Now you all need to make a single agreed list of those problems for further work." The time for the second stage is not limited. At the second stage, it is advisable to use video recording.

The third stage of the game is the discussion of the results and the process of making a game-wide decision, discussion of the list.

Thus, the business game "Motivation" allows you, firstly, to find out the problems of each participant, and secondly, to describe the "problem portrait" of the group, thirdly, the business game can be used as a procedure for observing the process of a group discussion with the aim of further teaching how to conduct group discussions. In addition, the business game "Motivation" allows the trainer and training participants to observe the processes of group formation, selection of a leader, etc.

The following list of problems and management situations is offered:

1. Establishing contact with subordinates, business partners and other people.

2. The ability to listen (active listening).

3. Motivation (the ability to persuade, convince to do something).

4. Criticism. The ability to criticize, give negative feedback to subordinates and other people.

5. Praise. The ability to praise, give positive feedback to subordinates and other people.

6. Group discussion. The ability to conduct discussions.

7. Forms of group decision (brainstorming, etc.).

8. Argumentation (the ability to defend one's point of view, relying on evidence, arguments).

9. Relieving the interlocutor's emotional tension in a conflict situation.

10. Removing your own emotional tension.

11. The ability to resolve conflict situations.

12. Public speaking. Self-presentation.

13. Solving the problem (finding out the hidden motive).

14. Development of sensitivity (the ability to feel the state of another person).

15. Development of non-verbal communication.

16. Development of cognitive mental processes: memory, attention, imagination.

1.7. A questionnaire on team effectiveness

Team members receive a questionnaire in the form of a handout. Each participant evaluates his team based on the experience gained since the beginning of the training. After filling out the questionnaire (15 min) discussion of the results is held (20 min). Summarizing the results of the discussion (5 min). The trainer moderates all the stages.

Objectives.

1. The goals are clear and the people are committed to the achievement of these goals.

Roles.

2. The work is organized in such a way that it clearly contributes to the achievement of the team's goals.

3. Maximum use of individual capabilities of each team member.

4. Everyone clearly knows what he is responsible for and what work is expected of him.

5. Leadership is distributed among group members.

Team activity processes.

6. Decisions are made based on who has the most experience and information rather than on the basis of hierarchy and authority.

7. Conflicts in the team are considered openly and constructively.

Interpersonal relations and individual styles.

1. Trust and openness prevail in interpersonal relations and communication.

2. Time is allocated to analyze the process of joint work (how we treat each other, how we communicate, etc.) with the aim of improving it.

3. Flexibility, sensitivity to the needs of other people and a creative approach are encouraged.

Rate your team:

1 = you do not agree with the statement;

3 = you partially agree with the statement;

5 = you strongly agree with the statement.

1.8. Exercises aimed at building team spirit

(These can be used in team building training or as warm-ups to rally the training participants).

Proposal (2 min).

Everyone says one word at a time to make a sentence. The exercise is repeated several times. This exercise is also diagnostic. If the game freezes on any participant several times in a row, it means that he is not activated enough, or he is excited about something. This is a signal to the coach to pay attention to him.

Brownian motion (3 min).

The game is played without words. The task of each participant is to move freely in a certain space like atoms in a molecule and, having met each participant, look into his eyes and lift his mood by non-verbal means, at the same time, you cannot say anything or touch another participant.

This game raises the mood, establishes a friendly atmosphere.

Carousel (5 min).

The participants line up in pairs facing each other in two circles the inner the and outer ones. There is communication in pairs on one of the given

topics, and then the outer circle moves one person to the right to switch pairs, and the game continues until the members of the inner circle have met each member of the outer circle.

The topic for communication: "To say hello. To give a compliment. What makes me happy...".

Reflection: what are the feelings, what is the mood?

1.9. Role-playing game (training on trust "The sun")

One person stands in the center and closes his eyes. This is the "sun". The group ("planets") stands in a circle at a comfortable distance. You can also take different poses. Then the "sun" opens its eyes and looks at the resulting composition. After that, the person standing in the center can move the other team members to a distance that would be comfortable for him. As a result, everyone sees the real and desired picture of the group's relationship with the person and the person's relationship with the group. This is, in a certain sense, a variant of sociometry.

1.10. The exercise of forming a team contract

The method is brainstorming.

Each project team receives the task of preparing a draft team contract. The contract provisions are written down by the team on whatman.

After the brainstorming stage, the results are discussed. The group develops a unified vision of the team agreement based on the moderation process.

An example of a team contract:

• discuss work issues only within the team;

• give everyone equal opportunities to participate in team work;

• be able to listen to the interlocutor and apply this skill to practice;

• make informed decisions, if possible;

• listen to all team members before making a decision;

• before making a decision or giving an answer, try to understand the interests and wishes of all interested parties;

• start and end team meetings on time;

• come to meetings prepared.

1.11. Formation of roles and levels of responsibility

The method is role-playing: "Difficult" clients. Role rotation. Exchange of roles. A group portrait.

"Difficult" clients. Practicing the skills in evaluating the effectiveness of working with employees, the participants, in pairs, act out typical dialogues with colleagues. (The scenes performed may be recorded on video). Practicing telephone communication skills, participants act out telephone conversations with "difficult" clients. (The dialogues played out can be recorded on a recorder).

A role-playing game allows you to see and record not only the course of action, but also the attitude of a person to how he acts. At the coach's request, the observers share their impressions of what they saw and heard, and if a video or audio recording is used, the first observer becomes the performer of the role. As you know, "from the inside" we perceive our own actions differently than from the outside. Analysis of the role-playing game allows you to shake the usual stereotypes of your own actions, to think about how justified they are. A role-playing game with practicing actions gives an opportunity to consolidate the desired skills.

Role rotation is a way of organizing role playing, in which the role of the protagonist (main participant) is performed by all group members in turn. This technique allows each participant to play a role, gain relevant experience and demonstrate their approach to solving a given situation, although it has certain limitations when used in large groups.

Exchange of roles. There may be different options for exchanging roles. In one case, the exchange can be between two real-life partners, if they are playing themselves, or between the protagonist and a double. Otherwise, players are asked to play roles that are behaviorally or physically unfamiliar to them. For example, the roles of persons of a different gender, race, etc. The exchange can take place in the last scene or at the signal of the presenter. This method allows you to look at yourself through the eyes of another, empathize with his experiences, better understand the problem and constructively solve interpersonal problems.

A group portrait.

Goals: to offer team members to give and receive feedback necessary for effective and trusting cooperation;

to develop leadership qualities, the ability to analyze information about the processes taking place in the team;

to check the level of openness of the training participants and the degree of their personal correlation with the team.

Resources: a video camera or a camera that will allow you to capture a group portrait.

Time: for a group of optimal size, it will take from 40 minutes. Much depends on the readiness of the participants to conduct serious and detailed individual and group analytical work.

The progress of the game. This technique, which is called " a social atom", allows the participants to visually display the degree of contacts between the members of one or another formal or informal association. To do this, the person who is ready to be the presenter places the participants in some group photo, where the distance between the people is a metaphorical reflection of mutual attraction/repulsion between them.

However, the matter does not end with the reflection of the "internal structure" of the team. The presenter will need to provide the players with those poses and facial expressions that, in his opinion, are characteristic of them during the period of group interaction.

This task is not at all simple. It requires the ability to analyze, a great creative potential, and a certain personal courage – not all teammates may like the place reserved for them or the pose, facial expression offered by the host.

When the group is lined up in the desired composition, the host joins it, taking his place, taking a pose and facial expression corresponding to his presentation.

It is good if there is an opportunity to take a group photo, not forgetting to mention who worked on the group portrait. Such a document will be useful to both the coach and the team if it is saved in the archive.

Conclusion: game discussion.

We find out from team members their attitude to how they and the whole team look in the eyes of their comrades. How objective is this opinion? Who, in their opinion, managed to convey the processes taking place in the group as much as possible?

1.12. Exercise "Participants receiving their own role profile"

A list of basic roles.

Team task-oriented roles. A person who:

- defines problems: definition of general tasks of the group;

- seeks information: requests factual information about the group's tasks or methods for implementation of the tasks, asks for clarification on proposals;
- provides information: offers information for use in solving the tasks, explains proposals;
- seeks opinions: asks for opinions on the discussed issue;
- expresses opinions: makes statements about the discussed issues;
- checks feasibility: compares the proposed solutions with the real state of affairs;
- roles aimed at creating/supporting team work;
- coordinates: explains statements and shows their relationship with other statements, analyzes proposed options;
- harmonizes: settles disputes and disagreements, emphasizes the commonality of views;
- orients: helps the group adhere to the plan, detects deviations, offers procedures to improve the effectiveness of the group's work;
- supports and inspires: expresses approval of the proposals of other participants, demonstrates a warm and sensitive attitude towards them;
- accompanies: consistently advances through all stages together with the team, accepts other people's ideas, expresses agreement.

Individual roles (non-functional). A person who:

- blocks: interferes with the work of the group, causing disputes, providing unargued resistance and disagreement. Later returns to forgotten issues;
- evades work: takes a nap, engages in extraneous affairs, negotiates with others, etc.;
- deviates from the topic: turns the discussion into a personal conversation, bursts into a long speech on a short question, etc.

1.13. Exercise "Distribution of roles and positions in the team for effective achievement of the result"

Each team member fills out a matrix in which all team members have their technological roles written down, and adds 1 or 2 personality roles that he has seen in his teammates. Next, he draws a general conclusion about the correspondence between the technological role and the personal role of the team member.

The whole team then discusses the results and comes (tries to come) to an agreed team-wide opinion. The teams report the results obtained.

The result: a matrix of correspondence between production and personal roles of project teams.

Typical personal roles:

1. Chairman – chooses the path.

2. Shaper – gives a finished form to the team's actions.

3. Idea generator – puts forward new ideas and strategies.

4. Critic (monitor-evaluator) – analyzes problems from a pragmatic point of view.

5. Working bee (company worker) – transforms plans and concepts into practical work procedures, systematically and effectively fulfills the commitments made.

6. Team support (team worker) – supports the spirit of project participants, provides them with help in difficult situations.

7. Resource collector (resource investigator) – discovers and reports on new ideas, developments and resources available outside the project group.

8. Completer – supports the team's persistence in achieving the goal, actively seeks to find work that needs higher attention.

1.14. A test for evaluating the effectiveness of the team

Task 1

Rate each of the 40 characteristics on a scale of 0 to 4 and place your score in the appropriate box on the Team Performance Rating Tables.

Use the following scoring scale:

0 – the characteristic never corresponds to the command;

1 – rarely responds;

2 – often;

3 – usually;

4 – always.

1. Team members have a common vision of project goals, know why they work together and what is expected of them.

2. Team members freely express their thoughts and feelings without fear of the management's reaction.

3. Each team member feels an individual assessment of his contribution, trust and respect from the leader.

4. The team makes important decisions based on consensus and avoids easy compromises.

5. Team members take the necessary time to think and agree on decisions before implementing them.

6. Team members make full use of individual strengths, knowledge and experience.

7. Team members constantly improve the adopted procedures.

8. Team members support initiative, innovative thinking and original ideas.

9. Team members evaluate the results in accordance with the strategic goals of the project.

10. Team members actively participate in general meetings and discussions.

11. Team members are interested in ideas that work, rather than services of the authors of these ideas.

12. Each team member has a clear idea of what individual contribution the team expects from him.

13. Team members use effective tools for planning and tracking work.

14. Team members tend to use different approaches to find the best solution.

15. The team quickly and flexibly responds to changes in the external environment.

16. Team members recognize mistakes made and learn from them.

17. The team has clear priorities and goals.

18. Team members carefully listen to the opinions of colleagues.

19. Team members ask for, receive, and give honest feedback.

20. The team leader regularly conducts individual reviews of work results with each team member.

21. Clear and understandable procedures allow team members to easily perform their functions.

22. Team members try to avoid "groupthink", preserving differences in individual vision of the situation.

23. Team members perform different functions according to assigned roles and shared responsibilities.

24. Team members do not avoid direct and difficult questions to colleagues.

25. Team members are aware of the uniqueness and necessity of their work for the customer.

26. Team members have all the information necessary for their individual and collective work.

27. Team members are open and sincere in their feedback.

28. Team members take the initiative to coordinate joint work.

29. The team has at its disposal all the resources necessary for its effective work.

30. The team approves the appearance in the team of people with fresh views, ideas, and knowledge.

31. The team assesses and responds to the changing needs of its members.

32. Team members provide each other with mutual support, evaluate and celebrate individual and group successes.

33. Team members are committed to maintaining high standards and a high level of quality of work.

34. Team members respect the individual opinions of everyone and openly defend their position.

35. Team members take pride in belonging to the team and show mutual concern.

36. Each team member feels responsible for the overall result.

37. The team makes decisions in order to fulfill the specified criteria and minimize risks before the implementation of works.

38. Team members encourage critical evaluation and self-evaluation.

39. Team members consider change desirable for the team because it allows them to rethink the approaches taken.

40. Team members encourage individual work on themselves and improvement of knowledge.

Task 2

Place your rating on each of the 40 characteristics in the appropriate field on the Team Performance Rating Table. Sum up the points in each column of the table from A to H (Fig. 1).

A	B	C	D	E	F	G	H
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
TOTAL:							

Fig. 1. **A table for assessing team compliance**

Task 3

Transfer the total scores for each column of the Team Performance Scoreboard to the Team Performance Chart (Fig. 2) and shade each of the eight segments.

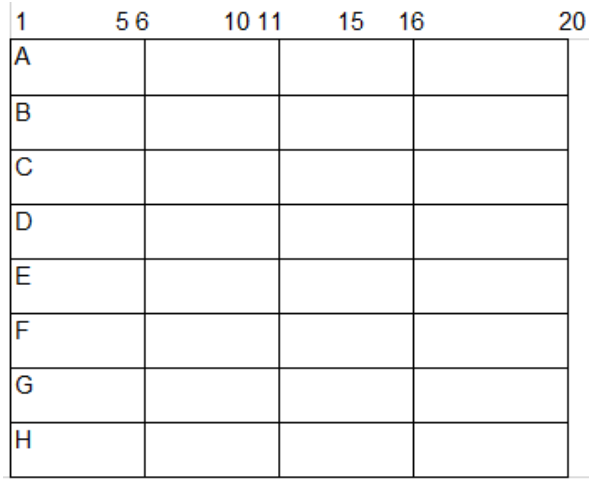


Fig. 2. **A team efficiency chart**

The characteristics of a highly effective project team:

- A – clear understanding of goals;
- B – openness;
- C – confidence in each other;
- D – division of competences;
- E – effective internal procedures;
- F – the advantage of the team, based on the qualities of individuals;
- G – flexibility and adaptability;
- H – continuous improvement and growth of competences.

Task 4

Overview of team performance evaluation results:

- discuss the results and try to develop an agreed opinion of the team about its effectiveness;
- choose 2 – 4 characteristics that need to be improved;
- develop a plan to improve the selected characteristics.

1.15. Exercise "How was the training?"

The exercise helps the participants to remember what happened at the training, to combine their impressions about it and the information received

into a single whole. Also, the exercise helps to complete the training in a lively, active and memorable manner.

Necessary materials: tablets, A4 paper, pencils.

Time: 15 minutes.

Description. All participants are divided into minigroups of 3 – 4 people, each minigroup receives a piece of paper and a tablet and, in 5 minutes, must come up with a maximum of adjectives-definitions that are suitable for the completed training. For example, active, informative, etc.

After that, they read the received list of adjectives.

Discussion. (Not necessarily). You can ask the minigroups to comment on any interesting ideas they come up with.

Version. Instead of adjectives, groups make a list of key concepts and terms related to the topic of the training.

Didactic methods and techniques that will be used during the training:

Minilectures. Presentation by the coach of the theoretical material for the corresponding stage. Duration is 3 – 5 minutes. The number of slides is 3 – 7.

Memory maps (mind-mapping). They help to systematically and compactly present a complex phenomenon or process. They can be built both on the computer screen using special software, and in a manual mode using paper and writing instruments.

Discussions. They are conducted with the participation of a trainer who acts as a moderator.

Tests. They contribute to the holistic understanding of a certain fragment of the acquired knowledge and skills, stimulate analytical and critical thinking.

Description of the training result (requirements for the training report).

The list of mandatory components of the training report "Management of a multimedia publishing house project team":

1. Formulate the goals of the training.

2. Determine the categories of project requirements:

- consumer requirements;
- system requirements related to the solution in general.

3. Draw up a consolidated calendar schedule of the project, determine its budget.

4. Formulate the team's mission and goals.

5. Compile a table of the needs of specialists for this project with an estimate of its possible employment (in man-days).

6. Conduct a team performance evaluation test.

7. An individual task (a variable component of the report).

A list of variants of the variable component of the training report "Management of a multimedia publishing house project team".

Each student should choose one question to study:

1. Business requirements for the project.
2. Operational requirements for the project.
3. A project communication plan.
4. A project development estimate.
5. A consumer training plan.
6. A schedule for testing the usability of the project.
7. Requirements for project testing.
8. A plan and calendar schedule of testing.
9. Operational requirements for the project.
10. A plan and calendar schedule of pilot implementation of the project.
11. A plan and calendar schedule of the final implementation of the project.
12. Functional specification of the project.
13. Compilation of questionnaires for the customer (2 participants).
14. Formation of a list of signs of a developed project team.
15. Criteria for evaluating the results of project activities.
16. A summary table with the content of the general opinion of all team members (2 members).
17. A list of questions on team effectiveness.
18. A matrix of compliance of production and personal roles of project teams.

2. Training "Situational business games"

The purpose of the training is deepening of practical skills in team development and presentation of innovative multimedia/polygraphic projects based on business games and simulation of force majeure situations.

The tasks of the training are:

mastering the technique of generating, substantiating and defending one's own opinions regarding an innovative project by providing relevant arguments, facts, etc., confirmation of one's position;

development of skills in complex analysis, discussion and finding the most expedient decision regarding the creation, design and applied development of a certain product;

increasing the degree of validity of decisions regarding the project improvement;

development of teamwork skills and interaction in a team involved in the development of an innovative project of a printed/multimedia product;

deepening of the ability to convincingly present own and/or team results;

development of self-analysis techniques in order to identify weak areas of development and form appropriate proposals to eliminate weaknesses.

The input data for the training (i. e. theoretical, instrumental and material base) are:

the theoretical base (knowledge):

1) knowledge and the scope of application of the categorical apparatus of general scientific, fundamental and subject areas of knowledge and understanding of the cause-and-effect relationships of actions and subsequent results;

2) knowledge of modern priority and strategic areas of development of multimedia and printing technologies;

3) knowledge of the components of the process of creating something new, awareness of the product of this process, its subject, the circumstances in which the creative process takes place, knowledge of the factors that condition it;

4) learning the main techniques and methods of motivation and stimulation of collective work;

5) knowledge of self-organization methods;

the theoretical base (skills):

1) the ability to apply conceptual knowledge acquired in the process of training and/or professional activity;

2) the ability to conduct research and implement ideas in the process of scientific and professional activity;

3) the ability to generate new, original ideas, values, discover new facts in response to the needs and opportunities of the business environment;

4) the ability to identify, conduct complex analysis and evaluate projects;

5) the ability to prove one's own opinion regarding the significance of one's own developments and achievements;

6) the ability to cooperate in a team to solve scientific and practical professional tasks;

7) the ability to present the results of one's own ideas and research and team work.

The tool base: any browser to search for information.

The material base: a flipchart, paper, colored felt-tip pens, a stopwatch, a hat, a computer, a smartphone, a camera.

The competences that the training will help students to acquire and develop are:

the ability to think abstractly, analyze, synthesize, and establish relationships between phenomena and processes;

the ability to adapt, to be creative, to generate ideas and actions in a new situation;

the ability to independently conduct research at the appropriate level;

the ability to work in a team and establish interpersonal interaction in the process of solving scientific and practical tasks;

the ability to apply knowledge in practical situations.

The structure and description of the content of the training stages:

the preparatory part: this includes trainings on the formation of a creative atmosphere (the game exercise "A non-verbal gift"), deepening of argumentation skills and defense of one's opinion (the game exercise "An oratory battle") and deepening of professional positioning skills for employment based on the professional competences available to the student (the game exercise "An employment bureau");

the practical part: this includes training to encourage the student's innovative thinking (th e game exercise "Sell an innovative project") and support for the development of the professional component of the student as a carrier of new knowledge about the innovation project (such a project is a master's thesis, the game exercise "Sharks and defenders"). The main thing is the correct presentation of such projects and the disclosure of their unique features.

The didactic methods and techniques that will be used during the training:

brain attacks that help students to express as many ideas as possible in a limited period of time, discuss and carry out selection of ideas;

discussions which are held with the participation of a trainer who acts as a moderator and coordinator;

role-playing games: involving students, in various roles (a project developer, a competitor, a buyer, etc.) in the staging process presentations for the purchase of a certain innovative project or in approval of decisions (buy/refuse to buy this project / a competitor's project, etc.) as direct participants in the events;

work in small groups which creates opportunities for the participation (with a corresponding role) of each student in the team, ensures the formation of personal close qualities and experience in the formation of professional and social communication;

presentations in the form of speeches in front of an audience, which you use for an oratorical battle, professional positioning, presentation of achievements, in the form of a new project, etc.

Description of the training result and the form of presentation of this result (requirements for the training report).

After completing all the game exercises, the student prepares a report based on the results of the work, in which the following should be displayed:

the of the training;

the teacher-trainer;

the purpose of the training;

the name of the game exercise;

description of the task of the game exercise (goal, available base, roles, rules);

presentation of the content of the game exercise according to the assigned role;

demonstrations of the results of the game exercise (drawings, diagrams, photos, etc.);

detection of problem areas, errors, etc. within the framework of the game;

conclusions after the game: proposals for their solution and elimination of the problems.

The prepared material should be reflected in the training report.

The progress and results of all game exercises can be photographed and displayed in a report.

2.1. Game exercise "A non-verbal gift"

The purpose of the game: formation of a creative atmosphere in a group of students.

The material base: paper, colored felt-tip pens, plasticine, a stopwatch.

The roles of the players: all students of the group participate in the game, each plays two roles:

1) the developer of the gift;

2) the recipient of the gift.

The role of the coach: the activator of the discussion, the coordinator of the game and the moderator of the distribution of time using a stopwatch.

The rules of the game:

1. All students of the group sit in a circle.

2. Everyone (in turn) should give a gift to their neighbor on the left (clockwise). The time for forming a gift is 10 minutes. The material base is available.

3. The gift must be given non-verbally (silently), but in such a way that the neighbor understands what was given to him.

4. Before giving a gift, the person who made it writes its meaning on a sheet of paper and turns the sheet over so that no one sees the inscription with the meaning of the gift ahead of time.

5. A student who receives a gift should try to understand what is being given to him. Until everyone receives their gifts, everyone remains silent.

6. When everyone has received the gifts, the trainer turns to the participant who received the gift last and asks him about which gift he received, his opinion about the meaning of the gift. The time for an answer with explanations is 1 minute 30 seconds.

7. After the participant has given an answer, the coach turns to the participant who gave the gift and asks what kind of gift he gave. A sheet of paper is turned over and the answer is read. The time for an answer is 30 seconds, for an explanation it is 1 minute.

8. If there are discrepancies in the answers, the trainer in the form of a discussion with the participants, finds out what the misunderstanding is specifically related to, what is unclear, ambiguous, etc. (the discussion time is 4 minutes). If a group member cannot say what was given to him, the trainer asks the group about it, everyone discusses and expresses their own opinions (the discussion time is up to 8 minutes).

9. The players record the results of the game, compare their own opinion about the gift with the content that the developer put into it, draw conclusions.

2.2. Game exercise "An oratory battle"

The purpose of the game: deepening the skills in argumentation and defending one's opinion in the process of speaking before the target audience.

The material base: a flip chart, paper, colored markers, a hat, a stopwatch.

The roles of the players:

1) speaker 1;

2) speaker 2;

The coach of the role: the distributor of the speech topics, the game coordinator and moderator of the distribution of time using a stopwatch.

The rules of the game:

1. The trainer distributes small pieces of paper for each student to write a desired topic for the speech of other students. The topics should relate to modern priority and strategic developments in the areas of computer multi-media and printing technologies, new products and their new properties, etc. The time for generating topics is 1 minute.

2. The coach collects the sheets, puts them in the hat and shuffles them.

3. The trainer closes his eyes, the students form a circle around the trainer and the circle starts to move counterclockwise.

4. With the help of an outstretched hand, the trainer chooses two participants for the speaking battle: speaker 1 and speaker 2.

5. The first participant (speaker 1) draws a theme for the battle from a hat and reads it loudly.

6. Speaker 1 is the first to speak on the chosen topic. The time of the speech is 2 minutes and 30 seconds. During the speech, the speaker has the opportunity to visually explain what was said with the help of a flip chart, paper and felt-tip pens.

7. After the speech, speaker 1 gives answers to the questions of speaker 2 (who asks the question first) and other students of the group. The number of questions from each participant in the discussion is not more than 4.

8. Then speaker 2 speaks on the chosen topic. The time of his speech is also 2 minutes and 30 seconds. During the performance, he has the opportunity to visually explain what he said with the help of a flipchart, paper and felt-tip pens.

9. After the speech, speaker 2 gives answers to the questions of speaker 1 (who asks the question first) and other students of the group. The number of questions from each participant in the discussion is not more than 4.

10. After the speeches of both speakers, students of the group vote for each of them and choose the winner based on the majority of votes.

11. Players record the results of the game, draw conclusions about the strengths and weaknesses of their performance as a speaker.

2.3. Game exercise "Sell an innovative project"

The goal of the game: to develop skills in activation of innovative thinking (generation and presentation of new ideas) during formation, substantiation, defense of own/competitive position regarding the new project.

The instrumental base: a browser for searching for information (in order to identify arguments to confirm the player's opinion, position).

The material base: a flipchart, paper, colored felt-tip pens, a stop watch, a computer, a smartphone.

The roles of the players: (teams of three people participate in the game):

1) the developer of an innovative project;

2) the buyer;

3) a competitor of the developer.

The role of the coach: the coordinator of the game and the moderator of the distribution of players' time using a stopwatch.

He rules of the game:

1. Students are divided into groups of three and each student chooses his own role within the triplet.

2. The developer must prepare a presentation of his innovative project (idea, target audience, product/service description, demand, specifics, features, budget, etc.) in 20 minutes (on a flip chart).

3. Within two minutes, the developer must talk about his project, trying to interest the buyer as much as possible.

4. The buyer must listen to the developer, then ask no more than three clarifying questions that will explain to him the information about the project that is missing, or information that is unclear, vague, incomprehensible, etc.

5. The competitor, in the process of telling and asking questions, records for himself information that is contradictory, weak, undisclosed and on the basis of which it is possible to build a company to "crush" the innovative project proposed by the developer.

6. In three minutes, the competitor conducts a company of destruction. He must convince the buyer that the proposed project is just a "soap bubble"

that will not be implemented or cannot be implemented in the way the developer presented it, provide convincing arguments (verbally and/or on paper). In the process of persuasion, the player competitor can use the presentation of the developer and the computer or smartphone to support the arguments with relevant statistical data and/or visualization of appropriate media materials.

7. The buyer makes a decision to purchase the innovative project or reject it.

8. The winner of the game is determined: if the project is sold, the winner is the developer, if not, it is the competitor.

9. After the game of each trio of players, a general group discussion is held in order to identify the strengths and weaknesses of the developer and the competitor.

10. The players record the results of the game, discussions and draw appropriate conclusions.

2.4. Game exercise "The employment bureau"

The purpose of the game: deepening the skills in professional positioning for employment based on the professional competences available to the student.

The material base: sheets of paper, colored felt-tip pens and a measuring tape.

The roles of the players:

1) an applicant;

2) a small group of three people, like an employment office.

The role of the coach: the coordinator of the game and the moderator of the distribution of time with the help of a stopwatch.

The rules of the game:

1. Students are divided into small groups of 4 people. One of the students (if desired) is assigned the role of an applicant, the others act as an employment agency.

2. The applicant has 2 minutes, using as many arguments as possible, to tell the representatives of the employment office about himself (that is, to present himself), his professional, abilities and skills, achievements and the sphere of interests, personal qualities, etc., that is, to position oneself in the market of desired professions. The narrative should be structured in such a way as to give a correct representation of the position/positions for which the applicant wishes to apply.

3. Before the presentation, the student, on a sheet of paper, records the names of the positions, from "1" to "4", for which he plans to apply, and turns the sheet over so that the representatives of the employment office do not see its contents. Then the applicant begins his speech.

An example of the applicant's report is given below:

"Hello, my name is Vadim Glebov! I have recently graduated from S. Kuznets KhNUE and received a master's degree in speciality 186 "Publishing and Printing", the educational program "Technologies of Electronic Multimedia Publications". In general, I believe that this speciality helps me a lot in life and provides opportunities for continuous professional development.

I am fluent in and have experience working with the Adobe software package (Photoshop, Illustrator, InDesign, After Effects, Captivate), Autodesk (AutoCad, 3Ds MAX), and I also do video editing.

Among the personal qualities, I can note purposefulness, stress resistance and discipline. As to communication and work in a team, I cannot say anything for sure, since I concentrate as much as possible on the task at hand and try to do all the work myself.

But still, I try to be sociable and sometimes resort to helping other people. I do all the work on time, I learn quickly, I like to learn something new, I try to be versatile and constantly expand my level of understanding in various subject areas.

My hobbies are: travel, tourism, I am interested in new computer technologies and computer hardware, as well as cars.

Thank you! Ready to answer your questions."

4. Representatives of the employment office can ask three clarifying questions to which the applicant gives short answers (time for each answer is 20 seconds).

5. After the completion of the applicant's story and answers, an active discussion takes place between the representatives of the employment office, in the framework of which they form a coherent, unified opinion about the representative as a professional person and a socially adapted person in the team. During the discussion, the representatives of the bureau express comments and wishes to the story, point out the shortcomings and draw a conclusion as to what position/s he could apply for.

Appropriate questions for the discussion should be used:

Did the applicant manage to formulate clearly and distinctly what position he is applying for?

What is (or still remains after answering the questions) unclear, illogical in the applicant's story?

What is inappropriate in the applicant's story?

What should be said to the applicant?

According to the representatives of the bureau, how should one build a self-presentation report?

6. The applicant is present during the discussion, but does not have the right to take part in it. It is useful for him to hear and know all this for his own conclusions regarding the quality of the report-presentation, he has made.

7. The result of the discussion is a list of alternatives, which the representatives of the bureau record on a piece of paper. There should be such alternatives, as a variable number of latent positions. If the number of alternatives is within this range, the applicant has won. If the number of alternatives is "0", the applicant has lost.

8. The alternatives are announced to the applicant. He analyzes whether the alternatives offered by the representatives of the employment office coincided with the alternatives on which the applicant focused from the beginning (recorded by him on a piece of paper).

An example of the result of the correlation of alternatives generated by the bureau representatives and predefined by the applicant:

"Mainly, the comments were about the fact that neither work experience nor any specific interest in something were given in more detail. The submission was rather vague. Jobs such as 3D designer, mobile game designer, junior designer or 3D assistant were offered. On paper, I had previously defined two vacancies: interface designer for games and 3D designer. I believe that, in general, the professional positioning took place in the right direction."

9. The players describe the results of the game, discussions and draw appropriate conclusions.

2.5. Game exercise "Sharks and defenders"

The purpose of the game: development of skills in qualitative presentation to the audience of the features, properties and specifics of an innovative project (the project is a master's thesis); development of reasoning skills and substantiation of one's own decisions and conclusions regarding the project (its being in demand, new qualities, etc.); convincing listeners based on relevant evidence; development of teamwork skills and team interaction;

leading a discussion and finding the most appropriate scientific, applied, technological and didactic solutions for the development and promotion of an innovative project.

The goal of the game: to help identify weak points in the master's thesis, which should be corrected before the defense.

The material base: sheets of paper with phrases for questions and a stopwatch.

The roles of the players:

1) the speaker is the author of the innovative project (i. e. the thesis);

2) the "Sharks" team;

3) the "Defenders" team.

The role of the coach: the coordinator of the game and the moderator of the distribution of time with the help of a stopwatch.

The rules of the game:

1. The group is divided into 2 teams named "Sharks" and "Defenders".

2. From each team in turn, a speaker (the developer of the innovative project) comes out. The team with which the speaker comes out acts as defenders, respectively, the other team as sharks.

3. The speaker has 3 minutes to present his project so as to make clear its purpose, designation, target audience, features, specifics of development, the essence of innovation (scientific and practical novelty), as well as what, in the speaker's opinion, deserves attention in this project, namely its key information.

4. Representatives of the "Sharks" team (after the presentation) take turns putting questions to the "Defenders" team, while the speaker (the author of the project) has no right to interfere in the discussion. The purpose of the questions of the "Sharks" team is to find weak points:

incomprehensible;

undisclosed;

incorrectly submitted project essence.

Their strategy is an aggressive attack.

The questions of the "Sharks" team should begin with the following phrases:

Sorry, but that's complete nonsense...

No one needs this because...

It doesn't make sense…

The market doesn't need it...

Only an amateur can...

Did you study at all...

There are many such proposals / ideas / developments on the market...

This is plagiarism in the sense...

You didn't offer anything new...

And what is the meaning of this...

Oh, you don't understand anything about this...

And why is it necessary...

You speak beautifully, but...

And you actually understand...

Cleverly confused...

We have come to kindergarten...

What a low level...

It's amazing to hear this...

5. After each question, the "Defenders" team, having consulted, aims to defend the position of the project author. They have to argue, justify the correctness of the project development, its usefulness and value, the fact of novelty, etc. A representative of the "Defenders" team is chosen to answer.

Their strategy is argumentative defense.

Each of the answers of the "Defenders" team must begin with the following phrases:

I want to point out that this makes sense because...

You're right, of course, but...

The author's approach is interesting...

I do not agree with you, I argue...

I want to agree with the author...

What kind of empty attacks on a person, he is...

So that's brilliant...

No one like...

And I will try to defend...

It is impossible to say clearly here...

The author is right in...

This is an in-depth study, so…

Everything is fine here, so...

We are all professionals here, so...

As a professional I say...

I understand this, so I will say...

Don't worry and don't be nervous, I'll explain now...

Take into account the author's youth...

6. Such dialogic interaction between teams allows the project author to understand and draw a number of useful conclusions:

what he did not disclose;

what he overemphasized;

that diverted the listeners' attention from the main content of the project;

what its scientific component is;

what is new in the approach to practical development;

who needs such a project at all, etc.

7. Players describe the results of the game and draw appropriate conclusions.

The following is an exemplary fragment of a report according to the author's project:

"As part of this project, the stages of development of an automated page imposition system are presented. The need to develop a methodology is justified by the need for continuous improvement of printing production and the revealed inadequacy of implementation of functionality, adaptability, and complexity of the tasks performed by the existing solutions for page imposition. The peculiarity of the methodology is the use of strategic management approaches to the selection of priority criteria and development lines at the level of the technological stage of page imposition.

The project also formed a selection of criteria, described the developed model of the relationship between the criteria of the efficiency of the automation system and the strategies of the printing business system. Based on the developed method priority directions were chosen, according to which an automated page imposition system was developed.

Key words: automated system, page imposition, printing business systems, strategic goals, strategies, criteria and strategies relationship model, page imposition algorithm, templates.

The scientific novelty of the developed methodology lies in the creation of an approach to the ranking of the evaluation criteria of the automated page imposition system, which takes into account the impact of the criteria on the strategic goals of the printing business system. As a result, a model of the relationship between the criteria for the effectiveness of automation systems and the strategies for the development of printing business systems was developed.

The peculiarity of the project is that not only a technique has been developed that can be used for the development of other automated printing production systems, but also in the developed algorithm for automating the page imposition, which had not been implemented before and makes it possible to create templates and increase the degree of integration with other automated systems ...".

The following is an example of the conclusions drawn by the author-speaker (based on the result of the interaction of two teams):

"During the presentation of information, I emphasized the most familiar terms and the implemented parts of the diploma that were quickly accessible for understanding, as a result of which the audience moved away from the desired direction of the discussion. Likewise, during the observation of the discussion of my project by two teams, it became clear that the same concepts are differently understood by the audience, which also resulted in misunderstanding of what was explained. That is, during the presentation of the methodology and criteria, it is necessary to give a list of all criteria and parameters or give an example of the main ones. It is also important to clearly formulate the key concepts of the business system, strategic goals and strategies As a result of this game I compiled a list of criteria that must be followed during a quick presentation of the project:

1) the sequence of the presentation of the material (it is necessary to follow the entire structure of the project, it should always be structured in the same way, but at the same time it is necessary to devote less time to detailing and explaining the operation of algorithms);

2) in a few words, it is necessary to justify the relevance and describe the target audience, the consumer environment and the stages at which the implementation of the development will take place;

3) during the entire report, use reasoned justifications that confirm the competence of the speaker and validity of the conclusions;

4) it is necessary to present the field that was studied with examples of what was subject to comparative analysis;

5) give a clear formulation of the main tasks and concepts (after the formulation of the object and subject of research);

6) give examples of structural elements that are key components of the project;

7) use only unambiguous wording to understand the wording and avoid abstract words or words that have a different scientific meaning (for this, it is necessary to take into account the orientation of the audience's knowledge);

8) pay attention to the features of the innovative project, its advantages, scientific novelty, maximum applicability;

9) at the end, it is necessary to sum up and tell about all the obtained results and once again say what tasks the proposed innovative project (diploma thesis) helps to solve.

A general conclusion was made: during the simulation game and demonstration of the project an error related to the sequence of the presentation was revealed. In order to convey information to the audience, I started with the practical component and over-detailed the program component, while the scientific component, which was the main one, was presented briefly at the end. Due to the change in the sequence and a large volume of description, the scientific part, the developed methodology faded into the background and the whole work was perceived as the development of the program. Thus, in order to avoid such mistakes, it is necessary to take into account priorities, start and end with the main thing, reveal and detail only the key concepts and submit the material in the planned sequence."

3. Training "Quantitative evaluation of alternative options for project approval and technological solutions"

Abstract. The training is devoted to issues of improving the quality of adoption of technological solutions related to the development of multimedia applications under conditions of resource limitations (time, financial, etc.). The result of the training is a quantitative justification of the technological solution (from possible alternatives).

The purpose of the training: to acquire competences (knowledge, skills and abilities) in making quantitatively justified project or technological alternative decisions in the field of multimedia application development.

The tasks of the training:

1) to perform a step-by-step analysis of the technological design process and the development of a multimedia application, which is intended as a prototype (it is possible to consider the result of diploma design as a prototype). As a result of the analysis:

to define and give a list of criteria for evaluating the quality of the prototype or the quality of the performance of one of the intermediate results of the technological process;

to determine the possibility of performing several variants of the same technological operation (process);

to perform an Internet search for possible two or three alternatives to the applications (relative to the prototype under consideration). It is appropriate to consider most of the absolute criteria and, to a lesser extent, the relative criteria;

2) to determine the relationship between the criteria for assessing the quality of the prototype or the quality of the execution of the intermediate results of the technological process, form the corresponding matrices of adjacency and reachability, perform a sequential analysis of the reachability matrix, build a rank model of the relationship of criteria in the form of a corresponding graph;

3) for the rank model of the relationship of criteria (see the previous task), consistently analyze for significance (importance, dominance) all relationships between criteria, removing from further consideration insignificant relationships, i. e. optimize the rank model;

4) to build a 5 – 7-cluster hierarchical model for evaluating alternative options for the quality of alternative options for a multimedia application or alternative options for performing a technological step considered in the previous tasks;

5) to calculate the intermediate and marginal priorities of each cluster of the model and the corresponding criteria that are inside the clusters. For this you need:

to build a set of templates of the corresponding matrices of pairwise comparisons;

to fill each of the templates with the result of an expert evaluation of pairwise comparisons of the current criteria. Two or three students should be involved as experts;

to perform sequential processing of pairwise comparison matrices. For this it is necessary to involve appropriate software tools, according to the method of analysis of hierarchies. As a result, quantitative assessments of the importance of intermediate clusters and criteria will be obtained, as well as the priorities of their alternative options for adoption of project or technological solutions under consideration;

6) to perform an analysis of the sensitivity (stability) of the model with respect to the given range of changes in experts' opinions.

Competences that the training will help to achieve and develop:

the ability to form an optimal set of evaluation criteria for the weakly formed process of substantiation of design and technological solutions;

the ability to quantitatively evaluate alternative options for design and technological solutions;

the ability to take into account the most significant evaluation criteria of the selected project-technological solution during its practical implementation.

A description of how the given competences can be used in the professional sphere.

The process of developing multimedia applications (editions) consists of the stages with options for implementation most often chosen based on intuition. This places increased demands on the professional training of developers of multimedia applications, which, as a result, increases the cost of the final product or, in other cases, deteriorates its quality. Mastering the above competences makes it possible to minimize design costs, which will help to obtain acceptable (allowable) quality of multimedia applications with minimal financial and time costs.

The initial data for training:

knowledge of:

the material of the disciplines, on the basis of which the prototype of the multimedia application will be developed (the choice of the discipline is arbitrary for each of the groups of designers);

systems in the form of graphs, elementary operations on matrices;

subject, supporting and functional technologies underlying the design and development of multimedia applications;

skill:

to formulate a list of criteria that make it possible to evaluate the effectiveness of the result of the implementation of the adopted technological solution;

to determine cause-and-effect relationships between criteria (presence or absence of relationship);

to perform elementary operations with matrices; apply multimedia technologies for the development of previously substantiated technological solutions paying the main attention to the implementation of the most important stages of the current technological process, as well as the criteria for evaluating the final multimedia product.

The tool base. One of the standard software products can be used as an instrumental training base: Expert Choice; PRIORITY; SPPR "Vybor"; Emperor 2AP; Great Decisions, as well as additional special software support, which was developed at the Department of Computer Systems and Technologies (KSiT), which provides automation the development of ranking models for the purpose of solving relevant optimization tasks.

The material base: a pencil, paper and a PC.

The structure and description of the content of the training stages

Stage 1

Form several student groups, each of which is united by one typical topic of diploma design. For example, topics related to the development of multimedia training manuals or the justification of the choice of design/ development methods of Internet-oriented multimedia products, etc.

As an example, we will consider the generalized topic "Methodology for the selection of instrumental support systems for the process of developing pedagogical design."

Stage 2

Carry out the formulation of the research task.

The purpose of the study is to develop a multi-level hierarchical model, which makes it possible to formalize the process of choosing an e-learning instrumental support system which is fully oriented to a certain pedagogical design, in the form of an appropriate methodology.

To achieve the goal, the following tasks must be solved:

to determine a list of possible options for modern e-learning instrumental support systems;

to indicate the conditions under which the problem is solved and the reasons that depend on the choice of one or another solution;

to investigate the factors affecting the choice of the most priority e-learning instrumental support systems and to determine the evaluation criteria for each of the factors;

to develop templates of pairwise comparison matrices for each of the clusters of the hierarchical model, as well as the corresponding nodes within the clusters;

to formulate questions to the expert and present his judgments (answers) in the form of significant numbers in matrix templates;

to synthesize the result in the form of a summary vector of priorities.

The description of the process of solving these tasks is the essence of the methodology for the quantitative substantiation of the e-learning instrumental support system.

Stage 3

Determine a list of options for alternative prototypes (or alternative options for technological steps) that can be applied to solve the current task.

For the example under consideration, the current task can be submitted as follows: to determine a list of possible options for modern e-learning instrumental support systems.

In the process of performing this stage, it is advisable to choose a project manager, after which to organize an individual search for alternative options for the SIP followed by a collective discussion of the search results. One of the options for performing this stage after appropriate collective discussion can be as follows: Sakai, Moodle, Web Tutor, LMS eLearning Server, Tutor, Learn eXact, Adobe Captivate, iSpring Suite, Articulate Studio.

Stage 4

Investigate the factors affecting the choice of the most priority e-learning instrumental support systems and determine the evaluation criteria for each of the factors.

In the process of performing this stage, it is expedient to divide the alternative prototypes obtained earlier into 3 – 4 parts and to assign each of the students of the current design group to further work with only one of the prototype groups.

As a result, for each of the alternative prototypes, information must be collected regarding the criteria (factors, features, etc.) for evaluating their quality. After collective discussion, this information should be provided in the form of an appropriate hierarchical model.

Fig. 3 shows an example of a possible version of the current stage in the form of a list and interconnection of clusters of the hierarchical model.

Description of hierarchical model clusters.

Level 1. This level contains one cluster that has one node for research purposes. In general, the number of nodes can be more than one.

Level 2. This level of the model has three groups (clusters) of nodes, which depend on the purpose of the study.

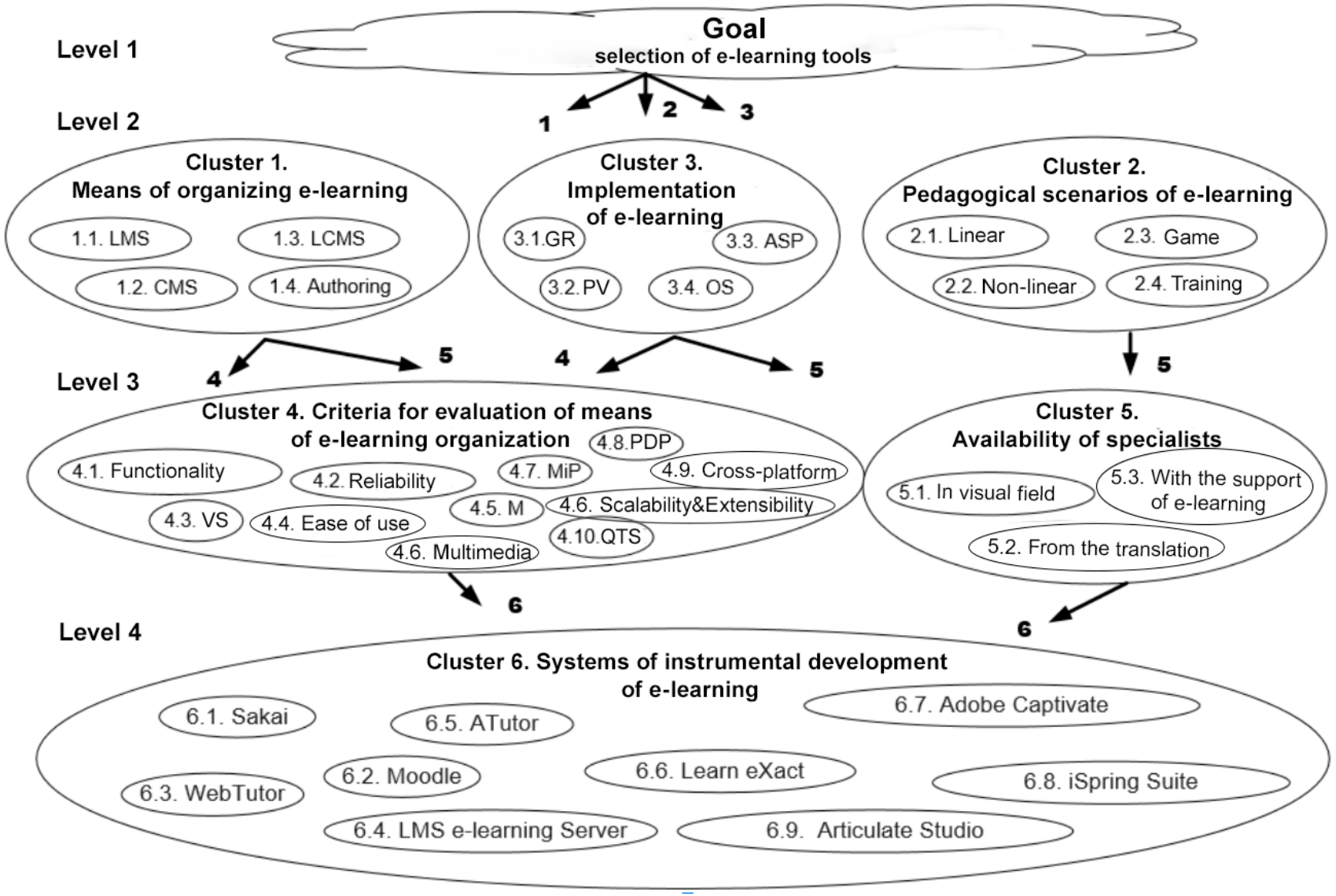


Fig. 3. **A list of levels of the hierarchical model of selection of e-learning development tools**

Cluster 1: means of organizing e-learning which contains the following nodes [1]:

1.1. LMS (Learning Management Systems).

1.2. CMS (Content Management Systems).

1.3. LCMS (Learning Content Management Systems).

1.4. Authoring (Authoring Packages).

Cluster 2: pedagogical scenarios of e-learning which contains the following nodes [4]:

2.1. Linear (linear script).

2.2. Non-linear (non-linear scenario).

2.3. Game (game scenario).

2.4. Training (training scenario).

Cluster 3: implementation of e-learning which contains the following nodes:

3.1. ready-made solution;

3.2. implementation project;

3.3. ASP (service);

3.4. OS (Open Source).

Level 3.

Creation of learning organization tools, which contains the following nodes:

4.1. Functionality.

4.2. Reliability.

4.3. Availability of a knowledge verification system.

4.4. Ease of use.

4.5. Modularity.

4.6. 100 % multimedia, nature.

4.7. Scalability and extensibility.

4.8. Platform development prospects.

4.9. Cross-platform.

4.10. Quality of technical support.

Cluster 5. Availability of specialists, which contains the following nodes:

5.1. Specialists in the visual field who are carriers of knowledge through the training course, which is translated into online form.

5.2. Specialists in the translation of educational materials into online forms.

5.3. Specialists in e-learning support.

Level 4.

Cluster 6. Systems of instrumental development of e-learning, which contains the following nodes:

6.1. Sakai.

6.2. Moodle.

6.3. Web Tutor.

6.4. LMS e-Learning Server.

6.5. ATutor.

6.6. Learn eXact.

6.7. Adobe Captivate.

6.8. iSpring Suite.

6.9. Articulate Studio.

It should be noted that the number of hierarchy levels, for the most part, does not exceed five, but the list of clusters and their content is determined solely by the experience of the model developer.

The relationship between hierarchical levels and the corresponding nodes (see Fig. 3) is the basis of the process of forming the model structure (Fig. 4), which can be performed, for example, in the environment Super Decision.

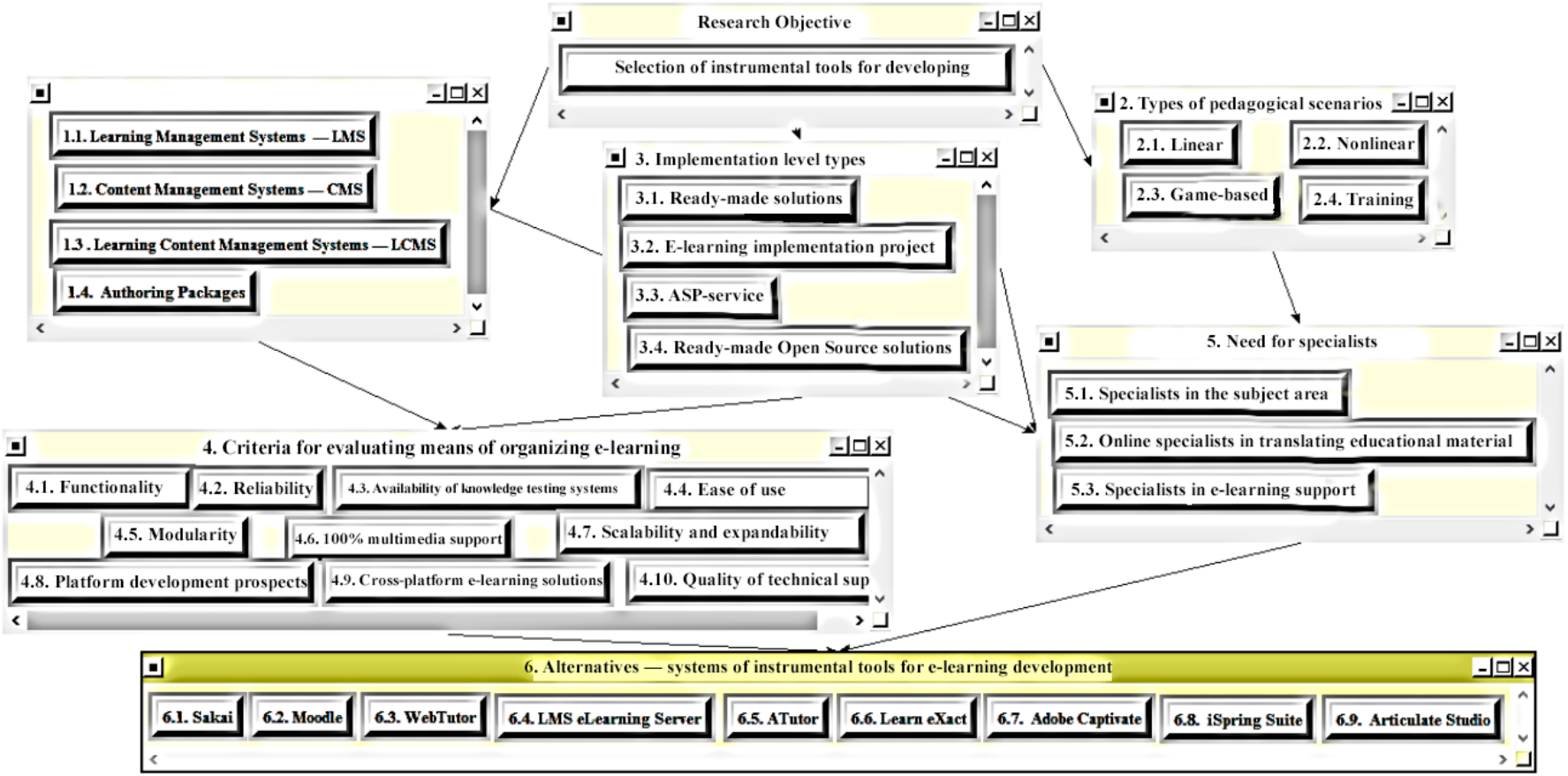


Fig. 4. **The structure of the hierarchical model of the selection of tools for supporting pedagogical design (the environment Super Decisions)**

Stage 5

Develop patterns of pairwise comparison matrices for each of the clusters of the hierarchical model, as well as the corresponding nodes within the clusters.

Formulate questions to the expert and present his judgments (answers) in the form of significant numbers in matrix templates.

Further, for each of the levels, the process of forming appropriate matrices of paired comparisons will be considered with an example of a question to the expert characteristic for this level. As an answer, the expert, based on his own experience, has to choose one of nine possible answers (from 1 to 9) from Saati's comparative scale, after which a corresponding cell of the matrix is to be filled.

According to the configuration of the hierarchical model (Fig. 4), typical questions to experts can be divided into three groups:

1) questions regarding the assessment of the impact of first-level clusters (clusters 1, 2, and 3) and their elements on the purpose of the study (choice of instrumental means of e-learning development);

2) questions regarding the assessment of the influence of the elements of the second-level clusters (clusters 4 and 5) on the elements of the first-level clusters (clusters 1, 2 and 3);

3) the issue of assessing the degree of implementation of criteria requirements (clusters 4 and 5) in alternative versions of e-learning tool development systems (cluster 6).

Typical questions and corresponding templates of pairwise comparison matrices for each of the groups under consideration are given in Fig. 5.

Cluster of Goals. Selection of Instrumental Tools for Developing e-learning	Cluster 2. Types of Pedagogical Scenarios	Cluster 3. Types of Decisions Regarding e-learning Implementation
Cluster 1. Tools for Organizing e-learning		
Cluster 2. Types of Pedagogical Scenarios		

Fig. 5. **A template of the matrix of pairwise comparisons of clusters of the second level of the hierarchical model**

After filling the templates of all matrices, their total number according to Fig. 4 is 37, so it is quite natural to use specialized software packages for their formation and further processing. In this case, the environment Super Decisions was chosen, which differs from similar systems by the unique ability to process supermatrices and, as is known, to work not only with hierarchical structures, but also with feedback systems – holarchies.

A question to the expert regarding the assessment of the influence of the second-level clusters (clusters 1, 2 and 3) on the purpose of the study (choice of tools for the development of e-learning): "Estimate the degree of influence on the choice of tools for the development of e-learning on the Saati scale (the purpose of the study) means of organizing e-learning (cluster 1) compared to the type of pedagogical scenario (cluster 2), which is based on e-learning".

As a result, the expert gives a quantitative assessment which is entered in the corresponding cell of the matrix of paired comparisons. In this case, the expert gave a slight advantage to cluster 2 over cluster 1, which corresponds to Saati's grade 2. Clusters 1 and 3 and clusters 2 and 3 are similarly compared.

Fig. 6 shows one of the possible variants of the matrix of paired comparisons which was formed in the environment Super Decisions based on the current template (see Fig. 4).

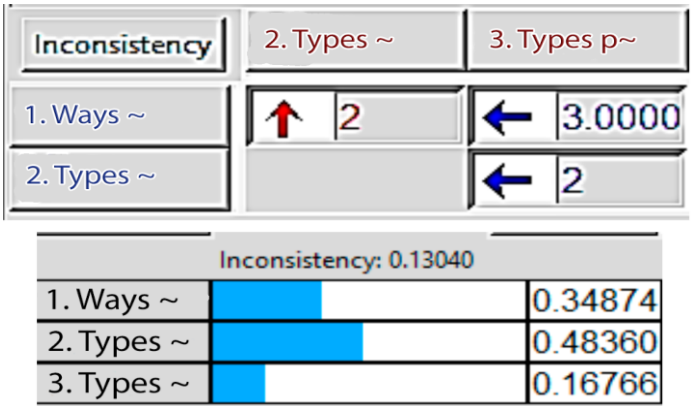


Fig. 6. **Matrices of pairwise comparisons of clusters of the second level of the hierarchical model and the corresponding vector of priorities (the environment Super Decisions)**

Step 5.1. According to the configuration of the model (see Fig. 4) the matrix template assessment of the influence of the elements of cluster 1 "Means of e-learning organization" on the choice of tools for the development of e-learning has the form shown in Fig. 7.

Regarding nodes 4.1 - 4.10	6.2. Moodle	6.3. WebTutor	6.4. LMS e-Learning Server	6.5. ATutor	6.6. Learn eXact	6.7. Adobe Captivate	6.8. iSpring Suite	6.9. Articulate Studio
6.1. Sakai								
6.2. Moodle								
6.3. WebTutor								
6.4. LMS e-Learning Server								
6.5. ATutor								
6.6. Learn eXact								
6.7. Adobe Captivate								
6.8. iSpring Suite								

Fig. 7. **A general template of evaluation matrices of e-learning criteria (nodes 4.1 – 4.10 of cluster 4) relative to alternative options**

A question to the expert regarding the assessment of the influence of the elements (nodes) of cluster 1 on the purpose of the study: "Estimate according to the Saati scale, what has a greater influence on the choice of tools for the development of e-learning: the means of organizing electronic learning of type 1.1. "Learning Management Systems – LMS)" or the means of organizing e-learning of type 1.2. "Content Management Systems – CMS"?

In this case, the expert gave a significant preference to tool 1.1 over tool 2, which corresponds to a score of 7 on the Saati scale.

Similarly, other elements of the cluster are compared. In Fig. 7 one of the possible variants of the corresponding matrix of pairwise comparisons is given.

Other clusters and their elements, which are shown in Fig. 4, are processed in the same way.

Stage 6

Perform a synthesis of the result of justification of the technological decision in the form of a summary vector of priorities.

For the example under consideration, the implementation of the current stage of the task is reduced to the formation of matrices of pairwise comparisons of alternative systems of instrumental development (cluster 6) regarding the degree of implementation of e-learning evaluation criteria in each of them (elements of cluster 4).

Step 6.1. The general matrix template is shown in Fig. 7. In the process of filling out the matrices, the expert is asked questions such as: "Rate, according to the Saati scale, the degree of implementation of a certain criterion (one of the nodes of cluster 4, for example: 4.1. Functionality) in the current pair of tools being compared (a pair of cluster 6 nodes, for example: 6.1. Sakai and 6.2. Moodle)".

If the expert answers that "The e-learning development environment "Moodle" has functionality that is slightly superior to the functionality of the "Sakai" environment, then grade 3 is written (according to the Saati scale) in the corresponding cell of the comparison matrix.

Step 6.2. The formation of matrices of pairwise comparisons of alternative systems of instrumental development (cluster 6) regarding the assessment of the need for specialists to support the development and implementation of e-learning systems (elements of cluster 5).

The general matrix template is shown in Fig. 8.

Regarding nodes 5.1 5.2 5.3	6.2. Moodle	6.3. WebTutor	6.4. LMS e-Learning Server	6.5. ATutor	6.6. Learn eXact	6.7. Adobe Captivate	6.8. iSpring Suite	6.9. Articulate Studio
6.1. Sakai								
6.2. Moodle								
6.3. WebTutor								
6.4. LMS e-Learning Server								
6.5. ATutor								
6.6. Learn eXact								
6.7. Adobe Captivate								
6.8. iSpring Suite								

Fig. 8. **A general matrix template for assessing the need for specialists (nodes 5.1, 5.2, 5.3 of cluster 5) to support the development and implementation of alternative e-learning systems**

In the process of filling out the matrices, the expert is asked questions such as: "From the side of assessing the need for specialists to support the development and implementation of alternative e-learning systems (one

of the nodes of cluster 5, for example: 5.1. Specialists in the visual field), how much for one of the paired comparison systems (for example: 6.1. Sakai) the presence of specialists of this profile is more important (according to the Saati scale) compared to the implementation of the second system (for example: 6.2. Moodle)?"

Similarly, as a result of the implementation of the current stage of the method under consideration, 37 matrices of pairwise comparisons will be formed, for which, according to [7], the current vectors of priorities, as well as indicators of agreement of experts' answers, should be calculated.

Step 6.3. Calculation of the final vector of priorities of alternative options for the development of e-learning tools.

Calculation of the final vector consists of two steps, the first of which determines the current priority vectors of model clusters and their elements, and the second determines the final priorities of all model nodes.

All calculations were performed using the built-in Super Decisions add-on software, the mathematical basis of which is the theoretical basis of the method of analyzing hierarchies.

An example of the result of the calculation of the priority vector of clusters of the second level of the hierarchical model is shown in Fig. 9, and the priority vector of the elements of the same cluster is shown in Fig. 10.

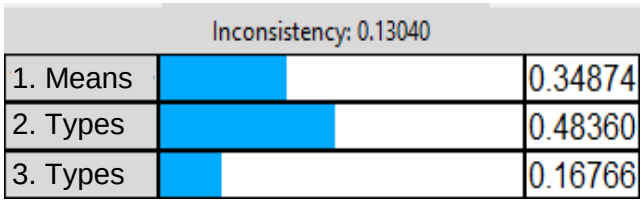


Fig. 9. **The current priority vector of clusters of the second level of the hierarchical model (calculated on the basis of the matrix (Fig. 6) in the environment Super Decisions)**

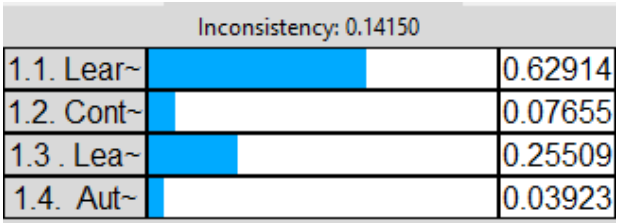


Fig. 10. **The current vector of priorities of the elements of cluster 1 "E-learning organization tools" in the environment Super Decisions)**

It follows from the above figures that cluster 2 – "Types of pedagogical scenarios" has the greatest influence (0.483) on the choice of e-learning instrumental support systems, and element 1.1 – "Learning Management Systems – LMS" of cluster 1 is dominant (0.629), as to the of influence on the purpose of the study.

The list of normalized final priorities and their marginal equivalents for all nodes of the model is given in Table 5.

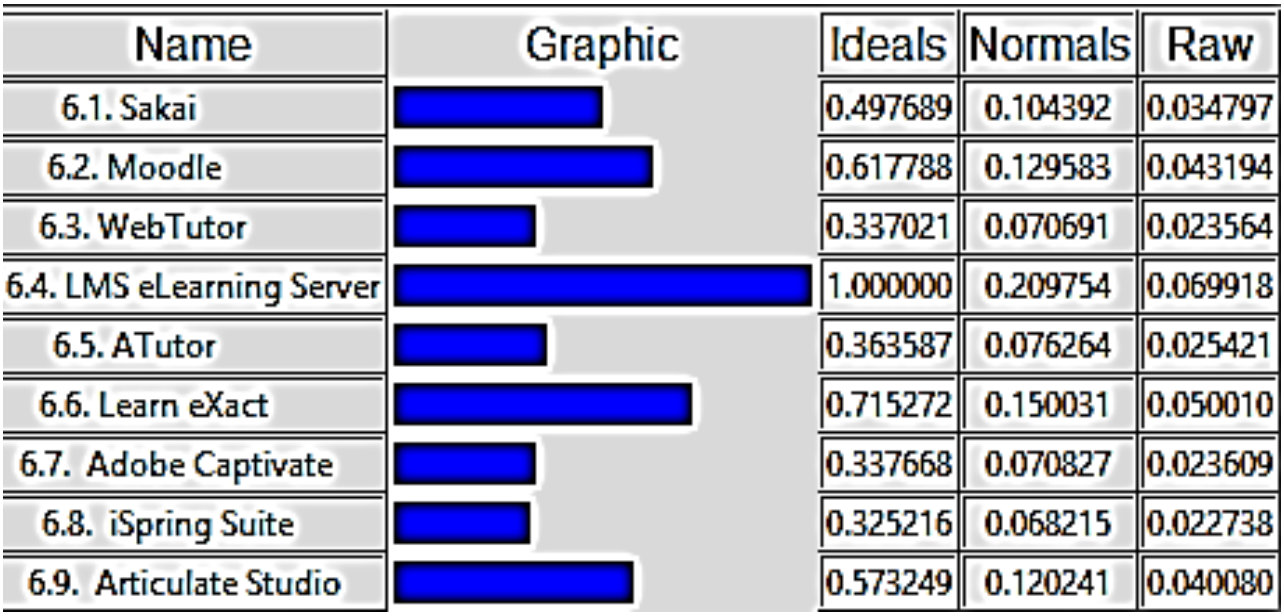
Table 5

Distribution of final and marginal weighting coefficients of hierarchical model nodes

Node names	Final weighting factors (normalized relative to clusters)	Limit weight coefficients
1.1. Learning Management Systems – LMS	0.62913	0.073135
1.2. Content Management Systems – CMS	0.07655	0.008899
1.3. Learning Content Management Systems – LCMS	0.25509	0.029653
1.4. Authoring Packages	0.03923	0.004560
2.1. Linear	0.06092	0.009821
2.2. Non-linear	0.10552	0.017010
2.3. Playing	0.26427	0.042601
2.4. Training	0.56929	0.091770
3.1. Ready solution	0.08415	0.004703
3.2. Project on implementation of e-learning	0.50566	0.028259
3.3. ASP service	0.11610	0.006488
3.4. Ready solution Open Source	0.29409	0.016435
4.1. Functionality	0.07555	0.006718
4.2. Reliability	0.07105	0.006318
4.3. Availability of a knowledge verification system	0.13410	0.011925
4.4. Ease of use	0.05531	0.004918
4.5. Modularity	0.03548	0.003155
4.6. 100 % multimedia	0.10970	0.009755
4.7. Scalability and extensibility	0.08929	0.007940
4.8. Platform development prospects	0.19483	0.017325
4.9. Cross-platform learning	0.14137	0.012571
4.10. Quality of technical support	0.09332	0.008298
5.1. Specialists in visual field	0.59551	0.145548
5.2. Specialists in the translation of educational materials into online forms	0.16237	0.039685
5.3. Specialists in e-learning support	0.24212	0.059178

It should be noted that the current (for example, Fig. 10) and final (Table 5, nodes 1.1 – 1.4) priorities of the elements of the first, second and third clusters match. This is due to the fact that these clusters are connected to only one top-level cluster (target cluster). At the same time, the elements of clusters of the third and fourth levels are related to two/three clusters of the previous levels, therefore, during the calculation of the corresponding final priorities, two or more current priorities of the same name are taken into account.

Fig. 11 presents the final priorities regarding the choice of alternative systems of instrumental development of e-learning. Here are three options of scales of representation of the final result: an absolute scale (Ideals) with a separate graph; a scale normalized relative to the sixth cluster (Normals); a scale (Raw) of the limit values relative to the entire model.



Name	Graphic	Ideals	Normals	Raw
6.1. Sakai		0.497689	0.104392	0.034797
6.2. Moodle		0.617788	0.129583	0.043194
6.3. WebTutor		0.337021	0.070691	0.023564
6.4. LMS eLearning Server		1.000000	0.209754	0.069918
6.5. ATutor		0.363587	0.076264	0.025421
6.6. Learn eXact		0.715272	0.150031	0.050010
6.7. Adobe Captivate		0.337668	0.070827	0.023609
6.8. iSpring Suite		0.325216	0.068215	0.022738
6.9. Articulate Studio		0.573249	0.120241	0.040080

Fig. 11. **Final priorities regarding the selection of alternative systems for instrumental development of e-learning**

Conclusion. From Fig. 11 it follows that the best tool system for tool development of e-learning is "LMS eLearningServer", which has the highest priority. However, if it is necessary to make a choice between systems whose priorities do not differ significantly from each other, then in order to substantiate the final conclusion, it is necessary to study the final vector of priorities for sustainability.

Didactic techniques and methods of activating the learning process.

- work in small groups while reviewing possible options for technological solutions;
- brainstorming, which is related to the process of forming a list of criteria for evaluating a technological solution;
- use of methods of expert evaluations (MAI, MAS) of the degree of importance of the criteria under consideration;
- presentation of the results and discussion of possible options for application of them.

Description of the material (or information) that will be provided to students during the training as working material.

The students will be provided with the following working material:

a file with information in the form of practical (common, compared to current methodological guidelines) step-by-step recommendations for developing appropriate rank and hierarchical models;

file that is loaded into the tool environment Super Designer and demonstrates in full the results of the implementation of the structure and description of the content of the training stages based on the example of the generalized topic "Methodology for the selection of instrumental support systems for the process of developing pedagogical design";

additional special software that has been developed at the KSIT department, which makes it possible to automate the development of ranking models for the purpose of solving relevant optimization tasks.

Description of the work summary form, in which students must present the results of the training (requirements for the training report).

The presentation of an individual task consists of 7 – 10 slides, on which you need to display all stages of creating a hierarchical and/or rank model, as well as possible options for implementing the most dominant criteria in the prototype being developed.

The report (in the form of an oral informative message) should take no more than 5 minutes.

Demonstration materials (drawings, diagrams, posters, etc.) may be used during the defense.

4. Training "Creation of a corporate multimedia publication by a team of developers"

Abstract. The training is devoted to the organization of teamwork during the development of a resource in conditions of limited time and division of labor. The result of the training is a created product and a report on the results of the work.

The purpose of the training: the acquisition of skills and abilities to effectively use the competences acquired during the training while working as part of a team;

acquisition of communication skills in production situations during the development of a multimedia product.

The tasks of the training:

mastering the techniques of establishing and maintaining working communications;

development of skills to take into account the capabilities and real results of the work of team members to increase the efficiency of development;

development of skills to subordinate one's activity to the interests of the team;

mastering the techniques of arguing one's position regarding decision-making in the course of development;

awareness of one's strengths and limitations in situations of professional interaction;

consolidation of the competences of the developer of multimedia publications during the practical division of labor.

The competences that the training will allow students to acquire and develop:

the ability to perform the development of a multimedia product under the conditions of division of labor and various limitations (time, equipment, software security, etc.);

the ability to analyze and evaluate the teamwork process.

To successfully conduct the training, students must:

know:

technologies and basics of web resource development;

approaches to division of labor during the development of multimedia products;

basics of design and development of web resource interfaces;

technology and basics of creating media content (text, visual, audio and video);

be able:

to find and use available development tools;

to create media components for web resources;

to develop web resources using various tools.

To perform the work, students need computers and the following software: a graphic editor, a program for creating web pages, a sound editor, and a non-linear editing program. The selection and search for specific tools is carried out during development.

The structure and content of the training stages:

1. The introductory part.
2. Organization of teamwork.
3. Formation of project teams.
4. Work on the project.
5. Preparation and presentation of work results.
6. Summary, selection of the best projects.

A sample distribution of time between stages and a summary are given in Table 6.

Table 6

Distribution of time between stages

Period from the beginning	Content of the stage	Result
1	2	3
20 min	**Introduction:** acquaintance; clarification of the purpose and tasks of the training; work regulations	Mastering the goal and tasks
25 min	**Organization of teamwork:** formulation of the development task; teamwork requirements	Clarification of the lesson plan
30 min	**Formation of project teams:** determination of team composition;	Distribution of participants into teams of 3 – 4 people.

Table 6 (the end)

1	2	3
	acceptance of the main characteristics of the project; distribution of roles; development of a network schedule	Selection of the company for which the publication will be developed. The basic layout of the resource, a list of element types
10 min	Break	
2 hours	**Work on the project:** creating a layout; creation of elements; content search; drafting the layout; functional development; resource testing; publishing on the server	Selection of technology and means for project implementation. Resource design. Created elements, a layout, developed functions. A ready resource. A list of questions that were checked during the tests
10 min	Break	
50 min	**Preparation and presentation of work results:** evaluation of the result; preparation of a presentation; a report on the results	A list of questions that were checked. In the presentation (report), it is necessary to display: the assigned task; a list of tasks for the team; distribution of roles; a network work schedule; main problems and how they are solved; assessment of the contribution of team members
35 min	**Presentation of results:** the coordinator reports the main results, demonstrates the product, evaluates the work of the team members; a report (accompanied by a presentation)	
15 min	**Summary of the training:** selection of the best projects	

The introductory part contains an introduction, a discussion of the regulations, an explanation of the goals and objectives of the training.

The main content of this stage consists in describing the course of training, creating an atmosphere in which further work will take place. Since the trainer and the participants have already met during the previous training,

the acquaintance is reduced to a reminder of joint work during the study of their respective disciplines: "Fundamentals of Design Web Publications", "Technologies of development of web resources", "Development of Web Applications".

Regulations and rules of the training. These measures will make it possible to prevent possible unwanted actions of the participants and to agree in advance on important organizational points. Time frames for work, breaks and rules for behavior in the audience are announced. For example, the reasons for which it is possible to leave the auditorium to other rooms are determined: a break, as well as performance of development actions that require it. The characteristics of the equipment, the rules of using the equipment, limitations are given (depending on the specific audience and the situation).

Actions of teams that do not invest in the time allotted for training are especially conditioned. For them, at the end of the class, the trainer evaluates the degree of performance of work and a decision is made either to stop the development and analyze the reasons for failure, or to complete the development during independent work and discuss the results in additional time.

At the end of the stage, the trainer conducts a short discussion of what needs to be done. Several participants present their vision of the goals, progress and results of the lesson. This is necessary for a more accurate understanding of the group's requests and clarification of issues that should be discussed in more detail.

The organization of team work involves explaining and justifying the general plan of work in the lesson. The product being developed is a web-resource for presenting the products of some organization. The development task is formed by the team independently. For example, it can be the development of an information site for a notional company, described in such a way that it is possible to select the characteristics of the corporate style and composition of individual elements. The conditional characteristics of the organization are chosen by the team members independently, they should allow the participants to reasonably make the necessary project decisions (design, content, functionality, etc.).

The website should contain information about some products in the form of multimedia objects. Developments made during course and diploma design (3D models, interactive video, games, etc.) can be used as products.

Objects should be sufficiently informative, visually attractive (animated, voiced, etc.), and allow receiving additional data up to demo versions.

Resource pages should contain the following elements:

an animated logo;

videos with control elements;

an audiophone or a podcast;

an animated slogan;

animated decorative elements, etc.

As an additional functionality, the possibility of collecting orders for products or feedback on publication materials can be provided.

A team of developers is a group of multifaceted specialists created to carry out specific development. The composition of the team should correspond to the accepted division of labor during the creation of resources for the Internet network and the specifics of the project being developed. Developers can include a project coordinator (architect), a designer, a draftsman, a developer client software, server software developer provision, a developer of various visual objects (3D, animation, video, etc.), audio of various formats, text content, etc.

The distribution of specific duties is carried out taking into account the specialists required for the implementation of the project (based on the real features of the project), the available competences and personal preferences of the participants.

Formation of project teams. This stage takes place after clarifying the main idea of the training. Each created team forms a design task for itself in the form of a technical task or concept site, which display all the features taken into account. Accordingly, the actual composition of the team is divided into roles. The main focus is on maximizing the effect of teamwork. The effect of teamwork is determined by two main factors: the division of work into parts with the possibility of parallel execution of tasks and the execution of each work by a specialist with high qualifications for this work.

For the convenience of project analysis, a network graph in any form (for example, Fig. 12) or one of the computer programs, for example, Microsoft Project, can be used.

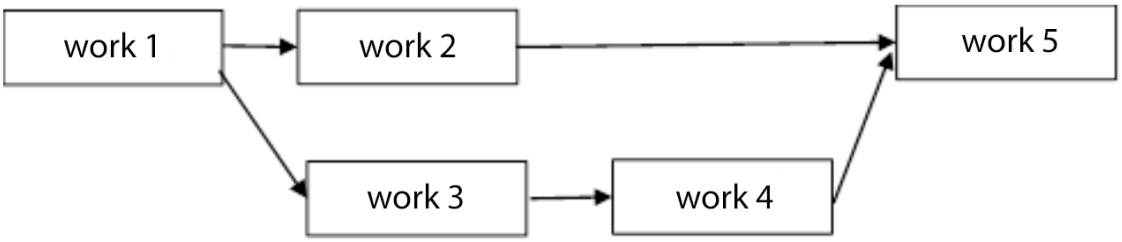


Fig. 12. **A network graph**

This schedule can be supplemented with estimates of the time required to complete the work. It is also recommended that a timeline of real time costs be kept for further evaluation of development efficiency.

Each participant, in accordance with his role, analyzes the capabilities and availability of tools for his work, as well as performs actions to find and install software. This work can be entrusted to one of the team members.

It is recommended that available freely distributed products for each type of work be used (Table 7).

Table 7

Examples of software products for typical jobs

Type of work	Programs
Site development	WIX, Site123
Video creation and editing	Virtual Dub, Movie Maker
Creation and processing of images	GIMP, Paint
Creation and processing of sound	Audacity
Creation of 3D models	Autodesk 123D, Autodesk Meshmixer

In addition, it is recommended that the software installed on the computers of the team members be taken into account.

Work on the project. This is the main stage to which most of the training time is allocated. Usually these are the following types of work:

finding and configuring tools (software and hardware);

development of the design of the site and its elements;

site layout;

development of multimedia objects for the project (video, audio, 3D and others);

creation of text content and images;

creation of additional functionality;

resource testing;

publishing on the server.

Completion of these works in the allotted time is ensured due to team-work, the use of effective development tools (constructors, online programs), the availability of homemade blanks (created during course work and diploma design) and, of course, some simplification in the approach to development.

Didactic methods. During the training, the following methods are expected to be used:

role play;

cases;

group discussion;

brain storm.

A role-playing game is the performance of certain roles by the participants in order to solve or work out a certain situation. In this case, the entire training is a game. Team members must create adequate situations, real production situations. For example, the inability of the typewriter to fully implement the designer's layout.

A specific role-play situation can arise and manifest itself spontaneously or be created by the trainer if the participants do not attach importance to it. For example, the lack of tools of the necessary quality for performing work with sound. The trainer draws attention to the lack of the ability to compress to mp3 format in the Audasity editor. Possible solutions include connecting to the editor of the Lame module for compression or using separate compressors (including online ones). The decision must be justified (compression quality, convenience, etc.).

A case is a problematic situation that requires an answer and finding a solution. The solution of the case can take place both individually and as part of a group. The main task of the case is to learn how to analyze information, identify the main problems and solutions, and form an action program. Cases can be used at different stages of training.

At the stage of clarifying the task, participants are offered a visual case screenshots of pages and links to real pages. Several unsuccessful decisions are deliberately recorded on them, and the participants must find them and

propose solutions for improvement. Among unsuccessful solutions there may be both visually identified design errors and technical ones (an illogical code, excessive complexity, etc.). For example, the presence of background sound and the absence of explicit tools to turn it off.

Group discussion is joint discussion and analysis of a problem situation, question or task. It is used in the course of solving problems that you have. Discussions in the group are organized by the project coordinator, while the general discussion is conducted by the coach. The general group discussion is usually structured (i. e. guided by the trainer with questions or topics for discussion). In project groups, the discussion is most often unstructured (the duration depends on the participants of the group discussion). Topics for discussion could be, for example, "Using a computer to analyze network graphs" or "Choosing a website design style".

Brainstorming is one of the most effective methods of stimulating creative activity. It allows you to find solutions to complex problems by applying special rules. First, participants are invited to express as many options and ideas as possible, including the most fantastic ones. Then, from the total number of expressed ideas, the most successful ones that can be used in practice are selected. The method can be used in the project group during development.

Preparation and presentation of work results (training report requirements). After completing all the work, the team prepares an oral and written report on the results of the work. The oral report must be accompanied by a presentation.

In the course of making an oral report and drawing up a written report, the created product is demonstrated and the main development issues are covered:

setting the objectives;
development of goals;
distribution of roles in the team;
a network work schedule;
basic technological solutions;
problems encountered and solutions to them;
evaluation of development efficiency;
assessment of team members' contribution;
conclusions.

The presentation prepared in this way, together with the created product, should be displayed in the training report.

Requirements concerning the structure and design of the report

The total volume of the training report is 20 – 25 pages printed on the printer (not including appendices); the volume of appendices is no more than 10 pages.

The structure of the training report:

the title page (the volume is 1 page, the form is given in Appendix A);

the table of contents (the volume is 1 page).

Section 1. Training "Management of the multimedia publishing house project team" (the volume is up to 6 pages);

Section 2. Training "Situational business games" (the volume is up to 5 pages);

Section 3. Training "Quantitative evaluation of alternative options for adopting project and technological decisions" (the volume is up to 5 pages);

Section 4. Training "Creation of a corporate multimedia publication by a team of developers" (the volume is up to 5 pages);

conclusions (the volume is 1 page);

a list of the used sources *(the volume is 1 page)*;

appendices (if necessary, up to 10 pages).

The general requirements for the text of the report are the logical sequence of the presentation of the material, the clarity and specificity of the presentation of the results of the student's work at each of the trainings within the framework of the following components:

the name of the training;

the teacher who conducted the training;

all components listed in the sections of the relevant trainings: "Preparation and presentation of work results (training report requirements)".

The materials of the report are stapled in a binder.

The material given in the report should be presented in an impersonal form.

In the text of the report, it is necessary to adhere to single terminology. It should not be overloaded with uninformative material. When using statistical data, conducting analysis, for example, the process of choosing an instrumental tool for the implementation of the task, etc., it is necessary to refer to sources of information.

The report is to be printed on one page of white paper of A4 format (210 × 297 mm) in full accordance with these guidelines and requirements of DSTU 3008-95 "Documentation. Reports in the field of science and technology. Structure and rules of design" [2].

Formatting requirements:

the font is Times New Roman;

font size is 14;

line spacing is proportionall, 130 % (1.3);

margins: top and bottom are 2 cm, left is 3 cm, right is 1.5 cm;

if necessary, highlight in bold;

do not use italics and underlining in the text.

The text of the report should be clear, well-edited, with wording that does not allow ambiguity in their interpretation.

Paragraph indents should be used to highlight parts of the text that are separate in terms of content and are connected by the general logic of the story. Incorrect division of the text into paragraphs interferes with the perception of the text.

The density of the text of the report, contrast and clarity should be the same. All numbers, signs, lines, letters must be clear and uniformly black throughout the report.

Page numbering

The pages "COVER PAGE" and "CONTENTS" are included in the general numbering of the report, but the page number is not placed on them. Numbering begins from the description page of the first training. The number is printed in Arabic numerals in the upper right corner of the page without the symbol "No." and a period at the end. The numbering should be continuous throughout the text. Illustrations and tables placed on separate pages are included in the general page numbering. A page number is put on them.

The structural elements "CONTENTS", "CONCLUSIONS", "A LIST OF REFERENCES" and "APPENDICES" do not have a serial number. An example of incorrect numbering: "1. CONTENTS".

Each of the structural elements of the report begins on a new page.

The layout of the headings

The headings of structural elements are placed on a new sheet, printed in capital letters in the middle of the line and highlighted in bold type without underlining, without a period at the end (Fig. 13).

1. TRAINING "MANAGEMENT OF THE MULTIMEDIA PUBLISHING HOUSE PROJECT TEAM"

Fig. 13. **An example of the design of the title in the training report**

Names of trainings and their subdivisions (separated game exercises can be subdivisions) should have numbered headings.

Subdivisions should be numbered within each training, for example, "1.2." is the second unit (i. e. a game exercise) of the first training. Between the heading (subheading or paragraph) and the text there must be one blank line that separates the heading from the subheading, the subheading from the paragraph.

Headings of subdivisions are printed in small letters (with the first capital letter) and are presented with a paragraph indentation, which should be equal to 1.27 cm. At the end of the heading and subheading, there is no period.

Paragraph indentation should be the same throughout the text of the report.

The name of the next subdivision of the training and the beginning of its text should be located on the same page where the previous subdivision ends.

Note. It is not allowed to place the name of the training section and its subdivision at the bottom of the page if there is only one line of text after it.

Within the title of a subheading or paragraph, no hyphenation of words is allowed.

Illustrations

Illustrations (drawings, diagrams, photos, graphs, schemes, etc.) should be placed immediately after the text in which they are mentioned for the first time, or at the beginning of the next page. They must be separated by blank lines before and after the illustration and after the title of the illustration.

All illustrations must be referenced in the text. The reference to the illustration is made as follows: "The network schedule of works is shown in Fig. 4.1". The illustration number consists of the training number and the sequence number of the illustration within this training, separated by a dot.

So, for this example, this is the first illustration of the fourth training session. The illustration must have a caption, which is separated by a blank line before and after the signature.

Do not put a period at the end of the figure caption (Fig. 14).

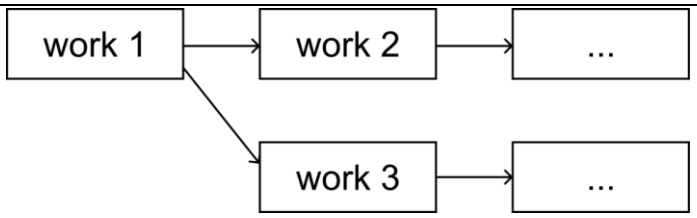


Fig. 14. **The network work schedule**

Fig. 14. **An example of presenting an illustration in a training report**

Explanatory information can be located under the illustration (if necessary).

If the illustration was not created independently by the master's student, it is necessary to provide a link to the source from which it was borrowed.

If a rather large figure is placed in the text, it is recommended that it should be placed in the appendices rather than in the main text.

Regarding the illustrations given in the appendices: their number consists of a capital letter denoting the appendix and the number of the illustration within the appendix. For example, if the illustration is presented in Appendix A, then it has the caption: Fig. A.1. The name of the picture.

Appendices

After the last page of the list of the used literature, before the appendices, a blank sheet of paper should be placed, on which, in the middle, "APPENDICES" in capital letters should be printed. In the content of the work, you must give a link only to the first page of the appendices.

Appendices include materials that:

are necessary for the completeness of the report, but when included in the main part of the work they may change the orderly and logical presentation of the work;

cannot be included in the main part due to their large volume, specificity or form of presentation, (for example, tables, diagrams, photos, etc.), they must be referenced in the appropriate sections of the report;

printed computer illustrations;

additional illustrations, etc.

Each of the appendices must start on a new sheet and have a heading. The title of the appendix is printed in the middle of the sheet on the next line after its designation (Fig. 15).

Appendix A Appendix name

Fig. 15. **An example of presentation of the title in the appendix of the training report**

If the appendix has a continuation, then the continuation of the appendix is printed with line indentation with the first capital letter, indicating the number of the appendix and figure, table, or formula number. For example, "Continuation of Appendix A", "Continuation of Fig. B.1".

Tables

Tables should be placed after first mentioning of them or on the next page of the report. The space between the text and the table is one line. An example of table design is given in Fig. 16.

Table 3.1

The name of the table

Fig. 16. **An example of table design in a training report**

The table name is written in bold.

All tables must be referenced.

Tables are numbered with Arabic numerals with sequential numbering within each section of the report, with the exception of the tables given in the appendices. The table number consists of the section number of the report and the serial number of the table within that section, separated by a dot. For example: Table 3.1 (i. e. the first table of the third section of the report).

The name of the table is indicated in bold in the middle of the line. It is printed in lowercase letters, except for the first capital letter. Do not put periods at the end of table names.

If a table does not fit on one sheet, it should, after "caps", have a row with table column numbers. In the case of transfer to another sheet, the table header is not duplicated, only a line with the table column numbers is placed instead.

If a table does not fit on one sheet, if it is moved to the other page, you must indicate the words "Continuation of the table" and its number (Fig. 17).

Table 3.1 (continuation)

1	2	3	4

Fig. 17. **An example of indication of continuation in a training report table**

Above the last part of the table, the end of the table is indicated as follows: "End of table" and its number (Fig. 18).

Table 3.1 (the end)

1	2	3	4

Fig. 18. **An example of completion in a training report table**

The text in the tables is printed in size 14, in some cases font size 12 may be used.

Formulas

Formulas are placed immediately after the text in which they are mentioned. They are separated from the text by blank lines before and after their introduction.

Formulas are placed in the middle of the line and numbered within the report section. Under the text of the formula after an empty line there should be an explanation of the variables of the formula (Fig. 19).

formula, (3.1)

where < *explanation of the components of the formula* >.

Fig. 19. **An example of formatting formulas in a training report**

Explanations of all elements used in the formula should be provided directly below the formula with an explanation of the meaning of each of them.

The first line of the explanation begins on a new line without paragraph indentation with the word "where", without a colon. The explanation of the meaning of each element should be given on a new line, explanatory symbols should be placed at the same distance from the edge of the sheet.

The number of the formula consists of the number of the section of the report and the serial number of the formula, separated by a dot. For example, formula (3.1) is the first formula of the third section of the report.

Referencing

References in the text are given according to the description of the source material. The form of the reference should be in square brackets with the indication of the serial number of the source in the list of the used literature. It is not necessary to specify the page number.

For example: "The description of verbal methods is given in [12]".

If there are several sources, the link looks like this: [2 – 4].

If a certain rule is cited, a specific definition of a concept is given, etc., it is necessary to indicate on which page of the source it first appears: [8, p. 214] or from which pages the information is given: [8, p. 112–114].

You can refer to sections of the report (training), subsections (game exercises), illustrations, tables, formulas, appendices, indicating their numbers. For example, "in section 1", "see subsection 1.4", "in Fig. 1.2" or so "(see Fig. 1.2)", "in Table 3.2" or "(see Table 3.2)", "by formula (3.1)" or "(see formula 3.1)", "in appendix A" or "(appendix A)".

The same referencing rules apply to tables and formulas in the text of the report and in the appendices. If the referenced items are located in appendices, the repeated reference form will be as follows: see Fig. A.1, see Table B.2, see formula B.1.

A list of references

The list of sources cited in the report should be given after the conclusions of the entire report on a new page. There should be references in appropriate places in the text.

Information about the literature included in the list must be given in accordance with the requirements of DSTU GOST 7.1:2006 (GOST 7.1–2003, IDT) "Bibliographic record. Bibliographic description. General requirements and rules of compilation".

The number of sources should be at least 6 titles. Electronic resources together with other sources are listed alphabetically. First of all, only laws, acts, and orders are placed. Sources in other languages are at the end, also alphabetically.

After the text of the sections is made up, it is recommended that the end of all lines be checked. In order to guarantee the placement of text elements on the same line, use a non-breaking space using the key combination < Ctrl > + < Shift > + < Space >.

If there is a typo or graphic inaccuracy in the text of the report or appendices, it can be corrected by cleaning it or painting it with white paint and applying the corrected text in that place. No more than 3 – 5 corrections are allowed within the report.

The procedure for defending a report

Upon completion of the last training, the student must draw up a report on the comprehensive training and submit it in printed and sealed form to the graduation department within 3 days. Evaluation of each training session takes place separately by the responsible trainers based on the data of the report and practical results submitted for checking to the teacher in electronic form (the form of submission of practical results is discussed at the training).

Each training is evaluated separately: from 60 to 100 points.

The overall grade for complex training is calculated according to the formula:

$$G = ((T1 + T2 + T3 + T4) / N) + B, \quad (1)$$

where T1, T2, T3, T4 are grades for each of the trainings, which is displayed on the title page of the comprehensive report along with the signature of the trainer;

N is the number of trainings;

B is a bonus of three points for the timely submission of the report.

Note. If the training is missing in the report and the student did not provide the teacher with the results of taking it, such training is evaluated as not completed, i. e. "0" points.

The overall grade is determined in accordance with the Provisional Regulation "On the procedure for evaluating the results of students' studies according to the cumulative point-rating system" in S. Kuznets KhNUE (Table 8).

Table 8

The rating scale: national and ECTS

The sum of points for all types of educational activities	ECTS rating	Evaluation on a national scale	
		for an exam, a course project (work), practice	for credit
90 – 100	A	perfect	passed
82 – 89	B	good	
74 – 81	C		
64 – 73	D	satisfactory	
60 – 63	E		
35 – 59	FX	unsatisfactory	failed
1 – 34	F		

Recommended literature

1. Ділові ігри [Електронний ресурс]. – Режим доступу : http://pidruchniki.com/16850303/pedagogika/dilovi_igri.

2. ДСТУ 3008-2015. Документація. Звіти у сфері науки і техніки. Структура і правила оформлення. – На заміну ДСТУ 3008-95 ; чинний від 2017-07-01. – Київ : ДП "УкрНДНЦ", 2016. – 31 с.

3. ДСТУ 7157:2010. Інформація та документація. Видання електронні. Основні види та вихідні відомості. – Вперше ; чинний від 2010-07-01. – Київ : Держспоживстандарт України, 2010. – 20 с.

4. Концептуальні засади створення системи підтримки електронного навчання у вищій школі нового покоління [Електронний ресурс] : монографія / В. С. Пономаренко, О. І. Пушкар, І. О. Бондар та ін. ; за заг. ред. д-ра екон. наук, проф. В. С. Пономаренка, д-ра екон. наук, проф. О. І. Пушкаря. – Харків : ХНЕУ ім. С. Кузнеця, 2018. – 267 с. – Режим доступу : http://www.repository.hneu.edu.ua/handle/123456789/24198.

5. Метод аналізу ієрархій [Електронний ресурс]. – Режим доступу : https://dss.tg.ck.ua/ahp-help.

6. Пушкар О. І. Формалізація процесу розроблення педагогічного сценарію електронного навчання / О. І. Пушкар, В. В. Браткевич, І. В. Литовченко // Scientific Journal "ScienceRise". – Серія "Технічні науки". – 2016. – № 10/2(27). – С. 34–41.

7. Хорошевська І. О. Структура віртуального навчального середовища підтримки студентоцентрованого навчання зі спеціальності "Видавництво та поліграфія" / І. О. Хорошевська // Інформаційні технології і засоби навчання. – 2020. – Т. 78. – № 4. – С. 203–218. – Режим доступу : https://journal.iitta.gov.ua/index.php/itlt/article/view/2885/1687.

8. Шишкіна Н. О. Ситуативні вправи і ділові ігри як засоби формування творчої активності та самостійності студентів [Електронний ресурс]. – Режим доступу : https://library.udpu.edu.ua/library_files/psuh_pedagog_probl_silsk_shkolu/4/visnuk_6.pdf.

9. The Super Decisions is decision support software that implements the AHP and ANP [Electronic resource]. – Access mode : https://www.superdecisions.com.

Appendices

Appendix A

The form of the document "A cover sheet"

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

INSTITUTE OF INFORMATION TECHNOLOGIES

DEPARTMENT OF MULTIMEDIA SYSTEMS AND TECHNOLOGIES

Report on comprehensive training

Completed by: 2nd year student
of speciality 186 "Publishing and Printing",
educational and professional program "Technologies of Electronic Multimedia Editions"
Full name of the student
Checked by: *academic degree, academic title, full name*
academic degree, academic title, full name
academic degree, academic title, full name
academic degree, academic title, full name

Kharkiv – 20...

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НАВЧАЛЬНЕ ВИДАННЯ

Методичні рекомендації до комплексного тренінгу для здобувачів вищої освіти спеціальності 186 "Видавництво і поліграфія" освітньої програми "Технології електронних мультимедійних видань" другого (магістерського) рівня (англ. мовою)

Самостійне електронне текстове мережеве видання

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