

## Implementation of the Multicomponent Algorithm of the Interdisciplinary Teaching Modules into Liberal Education of the University Students

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### Abstract

*The importance of the problem presented in the article is determined by the complex of educational strategies, goals and objectives of liberal education of the student - a tomorrow's professional in modern production who shows a new level of cultural identity the main characteristics of which are: awareness of the importance of liberal education in achieving life-plan, self-identification in society and at work; aspiration to make a conscious and decent choice of human values; formedness of consciousness and behavior, readiness to intercultural communication as a combination of competencies of productive interaction with people in the multicultural world. The purpose of the article is to scientifically and methodically underpin the efficiency of the multicomponent algorithm of the interdisciplinary teaching modules in liberal education of the university students. The paper submits the innovative approaches of self-transformation and self-identification of the university students in liberal education in the process of employing a multicomponent algorithm (the target, didactic, organizational - methodological, content-related and procedural components) of the interdisciplinary teaching modules. The article submissions are applicable for the teachers of the Humanities, academic registrars at the social sciences departments of the universities, graduate students and young scientists and students engaged in scientific activities.*

**Keywords:** multicomponent algorithm, interdisciplinary module, an innovative approach, the individual self-transformation, self-organization of the personality, a method, instructional design.

## 1. Introduction

### 1.1 The urgency of the problem

The creation, use and further development of the advanced technologies in the areas of productive labor, expansion of computer and information technology have challenged higher education to arrange the students' training in the way that would meet the needs of the production and economy sectors, domestic and international labor markets, the Federal

State Education Standards of higher education (FSES VPO) requirements and the students' personal preferences. Nowadays, the state and society expect the future specialists to actively participate in all spheres of economic reforms, enhance social stability, preserve and improve the humanitarian traditions, ideas and values of the multinational Russian culture. But the theory and practice of liberal education of the university students do not fully meet these expectations, as it does not correspond to the contemporary educational models of forming a creative personality with a high level of human culture. In addition, liberal education as a basic component of bringing up cultural values and personal traits of the future experts - intellectuals does not provide efficient interaction with cultural values, ethnic and cultural traditions, styles and lifestyles due to its essential characteristics. The Federal State Educational Standard (FSES VPO, 2009) operating in all higher education institutions of Russian Federation represents a legislative framework and at the same time a model of liberal education which reflects the complete set of mandatory requirements for the educational programs according to the specialties. One of the priority requirements is implementation of modular - competence-based approach at all levels of students' training, emphasis on its importance as one of the most holistic and systemic approach to learning that provides high efficiency and quality of the didactic process. The background ideas of the modular - competence-based approach in liberal education of the university students in our study has become a multicomponent algorithm of the interdisciplinary teaching modules of the Humanities as an important construct of the traditional didactics update: at the level of syllabus it includes in-subject, logically complete teaching elements (a topic, several themes or sections) from various disciplines are integrated to achieve particular educational objectives; at the procedural level - humanization of vocational education; at the level of teaching aids - the design technologies; at the level of educational results - the students' knowledge in liberal arts; at the level of conditions - the educational environment of liberal arts; at the proficiency achievement criteria - the existence, depth, scope of knowledge, the nature and maturity of the spiritual needs, the system of axiological orientations and social norms in various areas of activity, the ideals, the level of students' involvement in self-transforming and self-organizing activities. The practical implementation of the algorithm of the interdisciplinary teaching modules in liberal education (objective, didactic, organizational - methodic, content-related, procedural components) is carried out in a logical sequence of its components step by step: setting the objectives; determining the specific tasks to accomplish the objectives; determining the ways to solve the problems; analyzing the conditions for solving the problems; solving the problems within a particular material. This approach creates a creative educational environment in the learning process that is necessary for the student's self-transformation pertaining to the humanities (Mukhametzyanova, 2013; Sakhieva et al., 2015; Shaidullina et al., 2014).

### 1.2 *The theoretical - methodological novelty of the research*

The theoretical - methodological novelty of the research is the scientific underpinning of : 1) an interdisciplinary approach to the design and implementation of the teaching modules in liberal education; 2) the structure and content of the multicomponent algorithm of the interdisciplinary teaching modules.

### 1.3 *The practical implications*

The practical significance of the study is determined by using a multicomponent algorithm to modernize the liberal arts syllabus: the working curricula and modular programs drafts, the structure and content of the interdisciplinary teaching modules of the liberal arts, the criteria-based efficiency of the multicomponent algorithm implementation.

### 1.4 *The background of the theory and practice of pedagogy*

The theoretical - methodological background of the research includes: the concept of humanization and humanitarization of professional education (Afanasyev, 1986; Volovich, 2006; Nigmatov, 1998); the modern concepts of competence-based approach (Zimnyaya, 2000; Zeer, 1999; Makhmutov, 2000); the conceptual approaches to cultural projects design (Zapesotsky, 2003); the theory of teaching design of the vocational education objectives (Bespal'ko, 1983; Grebenyuk 2001, Novikov, 2003); the concept of project-based learning (Zimnyaya, 2000; Polat, 1999); the theoretical approaches to modeling professional activity (Kuzmina, 2001). The theoretical foundations are expressed in: the key concepts (the multicomponent algorithm, an interdisciplinary teaching module, liberal education, design), the objectives ( the present, prospective, reflexive), the principles (traditional ones: the connection between the content of the teaching process and basic concepts and methods, the systematic and logical sequence of the educational material presentation; the innovative ones: problematic and algorithmic character, modularity, dynamism, flexibility, parity, feedback, conscious perspective); in functions (methodological, self-organizing, regulatory that ensures the formation of the students' scientific

worldview; designing corporate customs and traditions of the educational institutions that meet the needs of the students, teachers, professionals of the basic enterprises; overcoming the individual's alienation from society, activities, family by strengthening moral values; the partnerships between the corporations and students, graduates, professors, parents and enterprise specialists), in teaching conditions (basic components of the interdisciplinary teaching modules, design technologies, a set of educational syllabi and curricula, the organizational - methodic structure of the multicomponent algorithm).

## 2. Materials and Methods

### 2.1 The methods

To achieve the objectives and tasks of the study we have applied a range of methods: a review of literature (philosophical, pedagogical, psychological, legal, scientific - methodical, subject-related); the study and generalization of mass and advanced pedagogical experience in liberal education of the university students; investigation of the educational, independent, research activity of the students and obtaining quantitative and qualitative materials by observing, testing, portfolio, eidos testing; the analysis of traditional and innovative syllabi, programs, textbooks, teaching materials. The leading research method is a method of designing a multicomponent algorithm of the interdisciplinary teaching module while teaching the students the liberal arts.

### 2.2 The indications and performance criteria for the implementation of the interdisciplinary teaching module in the university students' liberal education

The indicators: the existence, depth, scope of knowledge in liberal arts; the nature and maturity of the spiritual needs; the system of axiological orientations and social norms that can guide in various areas; the ideals, the degree of student's involvement in learning, research, project activities.

The formation criteria of the productivity indicators of the algorithm of the interdisciplinary teaching modules:

- Knowledge (philosophical, political, historical, literary - linguistic, legal, artistic, cultural, etc.). The indicators of presence or absence of relevant knowledge are the traditional and innovative forms of the intermediate and final check, interdisciplinary projects, certification system;
- The needs (communication, self-realization, freedom, understanding, knowledge, love, self-esteem, self-transformation, reflection, understanding the meaning of life and others.). The indicator of assessment of the level of these needs formation is the time it takes a student to satisfy them, as well as quantitative and qualitative indicators of the liberal education competencies;
- The axiological orientations (worldview, socio-cultural, moral, artistic - aesthetic, etc.), the norms, ideals, traditions and values. Their indicators are verbally expressed opinions, students' opinions, behaviors during the implementation of an interdisciplinary unit.

### 2.3 The methodological materials

#### 2.3.1 Basic concepts

The obtained results have allowed us to clarify the basic concepts of the performed research as a systemic category of pedagogical science enriched with innovative ideas of the interdisciplinary liberal education:

- an algorithm - a stepping implementation of the interdisciplinary communication of liberal education syllabus of the new generation specialists;
- the algorithmic teaching represents a learning process when knowledge is acquired through a consistent and step-by-step performance of logically interrelated interdisciplinary training operations;
- a training module is an organizational - methodical structure of the discipline, which includes didactic, interdisciplinary communication objectives, logically complete units of the teaching material, a methodic guidance and control system;
- an interdisciplinary module is the organizational form of interaction between the humanities, natural science, professionally - important disciplines in order to understand, study and update liberal education of the university students on the basis of network communication of the interdisciplinary norms, values, invariants, and universals of the scientific world (Budanov, 2013);

- a multicomponent algorithm is an organizational - methodical structure of the reduced learning activities of teachers and students to implement the interdisciplinary teaching modules based on the rules - the requirements of the network communication;
- a project is a prototype, a perfect example of the targeted object, state, an independently manufactured product (service) from its idea to full realization;
- a design is a process of developing real or conventional transformation projects in education; used as a creative technology;
- self-organization is the coordinated development of a student as a subject of education by means of the direct communication and feedback from the process of liberal education (external environment), capable of self-development, self-transformation through interdisciplinary characteristics, informativity, dynamism.

### 2.3.2 *The pedagogic conditions of the multicomponent algorithm of the interdisciplinary teaching modules*

The initial provisions of implementation of the multicomponent algorithm of the interdisciplinary teaching modules in students' liberal education in university have become:

- at the syllabus level - the interdisciplinary modules as an essential component of the traditional didactics rethought;
- at the procedural level - vocational education humanitarization;
- at the level of teaching aids - the design technologies in implementation of the interdisciplinary modules;
- at the level of educational results - the students' general culture and liberal education;
- at the level of conditions - a creative self-organizing environment of the interdisciplinary modules;
- at the level of liberal education achievement - applying knowledge; cultural and ethno-cultural self-identification; choosing the interdisciplinary modules as alternatives in liberal education; designing an algorithm of the interdisciplinary modules; readiness for interdisciplinary innovations.

## 3. Results

### 3.1 *The multicomponent algorithm of the interdisciplinary teaching module as a didactic project of updating liberal education*

It is based on the guiding principles of problem-based and design - targeted approach of the students' liberal education reinterpreted with the ideas of self-organization and self-transformation. Every module contains a detailed information about the activity objectives, the structure confirmed by the content of the material being studied and specific diagnostic and design tasks. The content of the material under study represents a complete didactic unit supported with the methodological guidelines, innovative knowledge control system allowing to adjust the learning process. The algorithm establishes and determines the most efficient sequence of modules studying. The teacher designs an algorithm of his own activities in which there are such important for the implementation of the interdisciplinary organizational unit methodological and didactic elements: the objectives of the class, the syllabus, the structure of practical training, appraising the initial level of students' competencies, students' independent work, analyzing and summarizing activities, the classes equipment, literature for the teacher (basic, additional, background, psychological - pedagogical).

### 3.2 *The pedagogic conditions for the multicomponent algorithm of the interdisciplinary teaching module implementation*

- If the initial level of the students' competence is determined by means of the targeted, problem-based, project - targeted diagnostic techniques. The diagnostics package is recommended to every student;
- if the preliminary training of the low-performing students to the study of the module had been carried out;
- if the situation of success in learning activities of the low-achieving students ( encouraging successes, the use of various methods and techniques of moral incentives) is arranged, if the advanced tasks for high achievers are developed, if the students are aware of the of knowledge quality criteria;
- if the measures to overcome the conflicts between students and teachers are developed;
- if the activities of teachers, group of students, faculties on various basis are integrated;
- if the activities of teachers and the most active students of the group are coordinated;
- if the measures to upgrade the educational environment of the institution, the group, subjects, personal worldview are developed.

### 3.3 The methodic materials to help students

1. The objectives of studying the interdisciplinary teaching module:
  - Whether the objectives are described through the academic, problem - based, design - based types of activity, what they should achieve as the result of the study;
  - If the specific quality requirements for implementation of the targeted activities are formulated;
  - Whether the significance of the module objectives for all the subsequent modules is explicit, if the motivational characteristics of the educational activities goals correspond the characteristics of the professional activity model.
2. The syllabus:
  - If the syllabus corresponds the learning objectives;
  - If the syllabus system is built according to the educational objectives (basic concepts, regulations, principles, laws, forms, the conclusions and applications);
  - Whether a graphical representation of the system and the structure of the syllabus is built;
  - Whether the algorithm of studying the educational material is determined.
3. The adaptive mechanisms of implementing the multicomponent algorithm of the interdisciplinary modules:
  1. If the components of the activity guidance of the module algorithm are accepted as given or developed by the students themselves:
    - the objective (outcome) of the study and the intermediate results of independent actions and their characteristics;
    - a general description of the profession represented in the module, its status and professional ideals;
    - the composition and order of actions (algorithm);
    - the means of action (theoretical and practical);
    - the ways and means of self-monitoring and self-correction in the course and as the result of action (practical and theoretical criteria);
    - the general (unified) mechanism - the instructions and guidelines presented in the form of an integrated system;
    - a sample of performing the actions on the basis of regulations.
4. The educational tasks:
  - if the problems are developed with a sample in order to organize and manage the syllabus acquisition at all stages of the interdisciplinary module algorithm;
  - the tasks of various types: with full, incomplete, redundant and contradictory conditions, with combinations to develop critical thinking;
  - the tasks to develop the ability to underpin the concepts, key provisions, processes and phenomena for stimulating analytical thinking;
  - the tasks of various kinds: standard and not typical, intended for differentiation of the phenomena and processes, their essence to form the expediency of the action (the orientation on the significant);
  - the tasks that require written or oral explanation (report) to form a conscious action;
  - the tasks of "distract " intended to form the strong-skilled action;
  - the attention tasks to develop the skills of self-control;
  - the "stereotypical" tasks for skill formation (automated action)
  - simulation games - the tasks based on professional role-playing communication.
5. The arrangement of the students' independent work while implementing the interdisciplinary training module. If developed (determined, identified, left):
  - the scheme of interaction between the teacher and students as well as between the students only;
  - the basic means of acquiring the learning material and self-organization: the instructions scheme, the system of training tasks with samples geared towards research activities;
  - the means of enhancing and fixing of the individual activity in the process of collective problem solving;
  - the requirements of the target activities parameters which will guide the quality management to achieve goals;
  - special diagnostic tasks for rapid tracing of typical errors and adjusting the current process of the information uptake;
  - the diagnostic tasks with sample solutions for checking and self-control according to the targets;
  - the technical tools of the students' self-organization;

- a special manual for the students' independent work in classroom and individually;
- a special guidance for classes containing the classes time card and recommended literature for managing independent work at all stages of activity.

#### 4. Discussions

The efficiency of the multicomponent algorithm of interdisciplinary training modules implementation in liberal education as a practical mechanism to implement the conceptual ideas of pedagogy into educational practice of higher school is supported by means of the results of the experimental testing of the special course "The cultural identity of a higher education student." This special course was designed according to the ideas of interdisciplinarity as a network communication of the academic disciplines cycles: the Humanities, Sciences, the professional and special. A multicomponent algorithm in this interdisciplinary communication serves as a methodological, organizational - methodical, target, didactic, content-related and procedural function. The criteria for students competencies achievement, their completeness, structure, volume, consistency, integrity determine the level of design culture and cultural identity of the students that is manifested in: operating the competencies (79%), in designing the socio - professional actions strategy (87%), in choosing the axiological alternatives (76%), cultural self-identification (65%), readiness to change cultural priorities (76%), creativity in the educational, professional and behavioral activities (87%). The achieved data in the control groups ranged 25 - 43%

#### 5. Conclusion

The theoretical and pragmatic importance of the problem under investigation is determined both with the educational imperatives and socio - economic policy and the needs of the labor market: a high demand for highly educated specialists with general cultural and professional competencies outstripping the global standards. The updating of the educational strategies is determined by the identified patterns. In this regard, modernization of higher school didactic structure enriched with the conceptual ideas of implementing the multicomponent algorithm of interdisciplinary teaching modules complies with the objectives and has practical significance for higher education.

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