

MODULAR TRAINING IN VOCATIONAL TECHNICAL HIGHER EDUCATION

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Abstract: *The present study concerns the necessity of modular instruction in the vocational training. The evident elements of the module are technical contents, training situation, the exact objective of module, and the module instruction manual. The use of modules gives the following advantages and conditionings: it is a strategy of academic progress, it offers big opportunities of the inter-disciplinary links and is integrated in all structures of the modular training in higher vocational technical education, eliminates or reduces redundancy, covers lacunas or omissions, provides the link between training, correction, specialization and other advantages.*

Keywords: *curriculum, knowledge, education system, skills, abilities, competence*

In conditions of limited resources and often insufficient for financing certain areas such as education, culture, health, standard of living rising, which increasingly depends on more production and trade competitiveness, which in turn are influenced by motivation, knowledge, understanding and skills of those engaged in the creation of goods and services, the quality of preparation of specialists is becoming a major task for higher technical education.

One of the main conditions for its solution is certainly, enhancing the pedagogical mastery of all teachers based on search forms, new methods and principles of teaching and learning process in vocational training. Major deficiencies, at present, appear in connection with the development of effective teaching methods of specialized disciplines.

Traditional methods used in the current time (lecture, laboratory work, independent work of students, course and diploma design and production practices) have a number of shortcomings. These relate, first of all, the incoordination while the discordance between different forms of training.

Another drawback presented by existing training process is low efficiency and insufficient development of independent activities of students, training future specialist competence. Competence is the synthesis of such qualities of the specialist knowledge mobility, flexibility method and critical thinking. Skills training in such acceptance require the integration of three leading factors: "brevity", modulation and problematization, and then drawing on this basis of a special teaching technology and modular training in any discipline of study. Mobility of knowledge in the structure of professional competencies of a specialist shall ensure by the brevity and modulation factors, by the flexibility of professional activity, which together constitutes the mobility and problematization factors, and the critical character of thinking is supposed that will form by means of problematization factors. Thus, determining the need for modular training scheme can present technological guidance of modular design, which can be applied in training (Fig. 1).

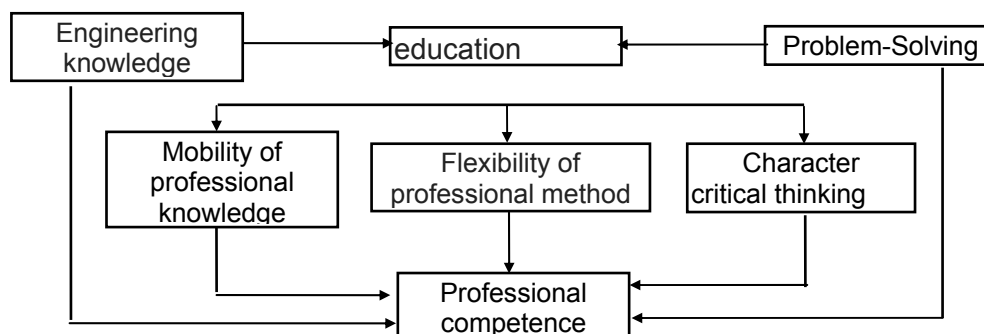


Figure 1: Model of modular training

In order to establish the essence of modular training in vocational training should be first and foremost determined: what is its foundation, on which is it based? The philosophical basis of modular training is the holism, i.e. the ability to conceive a totally integrated unit of information items, that they lose sequenced features. The concept of teaching mode is not still rigorously defined.

The most descriptive definitions posed as a set of specific educational elements that can be run independently from the rest of the system, which provides knowledge or skills prescribed, uncentred on content, but on learner's priorities who integrates the itineraries and various teaching logic. Expressing ourselves figuratively, the modular education is based on the general theory of functional systems, neurophysiology of thinking and pedagogical psychology. In capacity as principles serve principles of systemic quantification, modulation and problematization, the underlying operating systems of the human psychological activity, received through the different signalling systems (languages, graphics etc.). The following principles serve quantifying systemic principles, and problem-modulation, the underlying operating system of the human psychological activity, received through different signaling systems (language, graphics, etc.).

Along with these principles are involved principles: motivation, cognitive visualization, support on mistakes and economy learning time, etc.

In his conception of L.D Hainaut, the pedagogical module must satisfy the following criteria [2]:

- to present or define a set of learning situations;
- to possess a private function specified with care and to aim carefully defined objectives;
- to offer evidence to guide the studying and / or one who teaches and provide them a feedback;
- to be able to integrate in itineraries and logic learning contexts.

According to the study done by UNESCO concerning the methodology of the elaboration of a modular program for vocational and technical education, a module is considered as a process or a product that includes the following elements [3]:

1. The technical content, i.e. the discipline that is studied and ultimately will lead to the acquisition of knowledge gained in the process.
2. Learning situation: the context in which the content is studied;
3. The object of the module, formulated in operational terms;
4. Guide operation of the module;
5. Evaluation of the content understanding of the module;
6. The summary document for the learner.

If you compare Figure 2 and the UNESCO study, we observe that the modular training system developed by us include modular UNESCO program elements: defining portions autonomous teaching material (the quarter included a maximum of eight modules) are scheduled laboratory work, independent activities. Upon completion of each module is a microexamen. Group consultations are liquidated, period of session, educational year is a year with integrity, in the group is performed only laboratory work, other activities are individual.

So the training module shows the integrity of the types and forms of instruction, subjected to the general theme of the course. The dimensions and requirements of modules shall be determined by analyzing the content and structure of the discipline that would ensure the volume of knowledge, skills and exhortation of students shown in qualifying-functional feature of future specialists. As the parts of the modular organization of the training contents were chosen:

- general picture of modules developed to cover the subject and marking module position on the picture, as part of the whole course;
- summary of the module content;
- average length of scroll module;
- conditions for access to module (previous knowledge and skills);
- indication of modules that can be completed simultaneously;
- training methods and procedures of the theme module (content);
- bibliographical or documentary material and its sources of procurement.

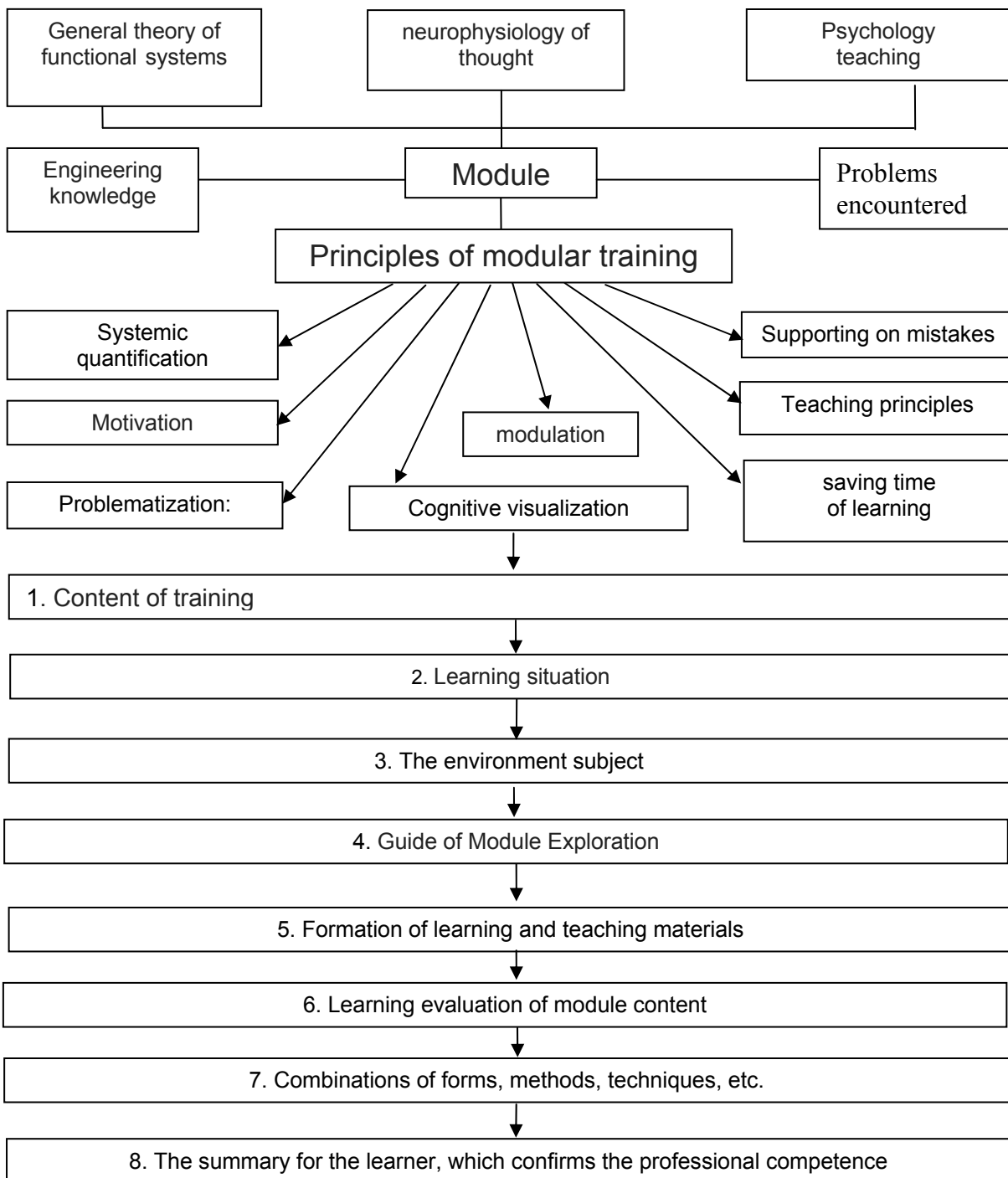


Figure 2: Methodology of modular design

Each module must be equipped with illustrative material, checklist of knowledge. The final stage of work should contain recommendations for the use of knowledge gained by students in the course and diploma projects, as well as postgraduate work.

Modules can be combined to form modular assemblies which covers knowledge and skills more complete. The modular system of initial formation in vocational and higher technical education can be adapted to lifelong learning because it allows any person, regardless of age and its initial formation, learn a job and refine.

Establishment of discipline from modules makes it possible to refund the time reserved for the separate studies of training process, increasing the share of laboratory work, as well as the independent work of

students. The changes indicated may concern, firstly, the volume and content of the teaching material in the form of traditional, descriptive- illustrative; the lecturer is required to seek new forms of lesson in which the student receives basic training along with knowledge and skills needed in the chosen specialty; laboratory lessons of the module are processed in complex with lectures.

The positive effect of modular training can only be achieved at the concentration of all types of training, provided by the module. Here different versions may be possible, planned several activities; two hours lecture, laboratory work four academic hours, activities and independent work of students (obligatory presence of the lecturer) in which they are studying some aspects of the topic taught in class.

The time allocated for independent work of students in the auditorium must be at least two hours. Practice of partial concentration of lessons can enhance the effectiveness of this form of training. However it appears the possibility of reducing the number of hours allocated for lectures. Finally, the lessons focus on this topic has another positiv aspect - improving the current control of students learning, what perspective can bring to the organization without training session. It is certain that the implementation of modular training will require organizational restructuring of the training process. It pertains to the planning activities of lecturers, laboratory training base, forming the contingent of students, taking into account the workshop production capacities; endowment the course with didactic-methodical materials, starting with intuitive and ending with recommendations for the study of modular program chapters.

The use of modular training leads to return to his true vocation teacher educator, allow him the fulfillment of tasks that will help students to acquire knowledge, raises the possibility of individualization of learning for the selection and training of young talents. A drawback of modular training is the fact that the composition of the programmes is particularly voluminous and heavy.

Application of modules during "constructive-technological design of clothes" has allowed us to detect the following benefits and conditionality:

- connects formal learning objectives;
- allow the articulation of formal and non-formal education;
- facilitates continuous updating of contents;
- opposed to the rigidity of traditional structures and programs that offer unique curricular paths;
- each module can easily articulate to other modules in an optimal structure for a given situation;
- provides the glue between learning, correction, specialization;
- lends itself easily to implement in computer programming languages;
- open wide possibilities of interdisciplinary contributions;
- allows individualisation, offering a range of alternative courses for the same subject;
- integrates into all structures of higher technical vocational education (and not only this);
- represents a relay of the democratization of education;
- cost and time of didactic module elaboration are considerable, requiring extensive work on cooperation between experts from different curricular hours;
- to increase awareness in the training of teachers and educators;
- modularisation has the status of innovation in the current academic educational practice and, as such, is facing with administrative resistance;
- modularity as a way of rigorous training, may reduce the risk of conventional examinations for admission to the higher cycles.

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