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PROJECTING A CURRICULUM SUBJECT MODULAR STRUCTURE ON THE BASIS OF SCIENTIFIC KNOWLEDGE INTEGRATION

The paper is devoted to the representation of main author's results obtained while treating the problems of pedagogical projecting a curriculum subject modular structure on the basis of scientific knowledge integration. The integration basis of the projecting is covered. Developed projecting technology is characterised. It is also outlined possible ways of the obtained theoretical results applications to the issues related to the coordination and interaction of different educational systems.

Keywords: pedagogical projecting, curriculum subject, curriculum subject modular structure, scientific knowledge integration.

Conference
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Статья посвящена представлению основных авторских результатов, полученных при исследовании проблем педагогического проектирования модульной структуры учебной дисциплины на основе интеграции научных знаний. Освещены интеграционные основы такого проектирования. Охарактеризована разработанная технология проектирования. Намечены возможные пути приложения полученных теоретических результатов к проблемам координации и взаимодействия различных образовательных систем.

Ключевые слова: педагогическое проектирование, учебная дисциплина, модульная структура учебной дисциплины, интеграция научных знаний.

Recognizing importance, complication and controversial character of the changing forms, scope and outcomes of complex processes in education systems it is relevant to emphasize our realizing of world outlook, economic, social and political aspects of contemporary education. The evidence testifies that world is currently surviving the age of deep changes concerning all branches of our life. It is displayed in quick renewing technologies, incredible mobility of social life, new forms of communication, new means of world vision and world realizing.

Ambiguity and non-linear character of these objective processes are reflected in modern science whose leading tendencies nowadays are knowledge synthesis, mutual enrichment of sciences both inside separate branches and between other scientific branches. It is developing conversion to really interdisciplinary research under which interpenetration of knowledge and cognitive methods is taking place. Under the circumstances requirements to modern education are getting tougher. It is natural since global science needs researchers capable to solve integrative problems, and global labour market demands qualified workers who have flexible and operative knowledge system is to be used in related branches, who are able to adapt quickly to technological changes, who are ready for renewing their educational level.

Under such conditions it is natural

that education on all its levels and in all forms of provision undergoes considerable changes. It has to response with appropriate and relevant improvements, and, first of all, with formation of adequate content of education reflecting integrative processes in different branches of science.

The aim of the paper is to represent main scientific results obtained by the author while treating the problems of projecting a curriculum subject modular structure on the basis of scientific knowledge integration as well as to outline the possible ways of these results applications to the issues related to the coordination and interaction of different educational systems.

As it was mentioned above problems of curriculum development for all forms and levels of learning are crucial and cause necessity of deep investigations. It can be explained by increasing demands to contemporary gradulators from universities, to their formed abilities of professional mobility and knowledge flexibility. Credit-modular system of students' training common now in the majority of universities is based on the system of modular structured curriculum subjects. It is necessary to emphasize that approaches to modular structuring of a subject and their results play an important role in subsequent process of learning and mastering material accepting by students, in formation of students' knowledge and skills system. A curricu-

lum subject is considered to be a mean of implementation of certain education content, and relevant modular structure of a subject can facilitate and improve these processes.

On the other hand, any curriculum subject, especially in higher professional education, is an embodiment of some scientific branch adapted to teaching and learning. Hence, it is to reflect correctly and adequately the branch's structure preserving main links between notions, concepts, facts, theories that really exist both inside the scientific branch and between sciences in a whole. It will promote and contribute to creation holistic and flexible system of students' knowledge. Such system of knowledge can be characterized by optimal information capacity, by readiness for implying in related areas, for mobile rising of students' educational level in their future lives.

However, very often the modular structuring of curriculum subjects does not preserve or does not convey necessary essential links between scientific knowledge which can cause negative consequences for trainees'. According to pedagogical studies, among such consequences there are forming of separate and uncoordinated system of trainees' knowledge, earning of purely specific skills instead of generalized ones, breaking of general holistic and logic of a subject as well as destroying of links between related subjects etc.

Therefore investigating of knowl-

edge integration mechanisms in scientific branches as well as searching of ways of these mechanisms embodiment at modular structuring of curriculum subjects is really urgent for higher education development and was one of the major tasks of our investigation.

The basis of scientific knowledge integration were determined in our research on the base of the retrospective investigation of influence of integration tendencies in science on the formation of the professional education content in general as well as on a curriculum subject in particular. It was theoretically grounded that didactic component of a subject (in order to reflect scientific knowledge integration) besides traditional functions has to realize such didactic procedures:

- revealing a subject specific characteristics, measures of implementation of its conceptual and methodological arsenal;
- forming of fundamental all-over-scientific notion potential;
- detecting integration potential of a subject, learning cross-discipline methods of research;
- providing adequate types and mechanisms of knowledge arrangement which are able to reflect variety and complication of cross-discipline links;
- carrying out three-aspect mutual penetration of curriculum subjects via formed fundamental notion apparatus, cross-discipline means of cognitive activity, and information content of subjects.

Forms of revealing scientific knowledge integration in education content were clarified. Logical sequence and stage-by-stage fulfilling of above didactic procedures were grounded and determined, what in total composed the integration basis of the subject modular structure projecting.

Didactic bases of this projecting were scientifically proved in our research. They are: the essence, aim, regularities, principles, stages and logic of the projecting. Crucial importance has also our elaboration of the projecting technology: we developed special didactic and technological procedures (based on the ideas of the 1) different levels of the education content formation; 2) different levels of knowledge generalization; 3) models of knowledge representation of the Artificial

Intelligence theory) to be done on each stage of the projecting in order to get as a result the modular structure of a subject keeping and spreading links between knowledge both inside a module and between modules and subjects of curriculum [1].

As long as we used at the subject modular structure projecting models of knowledge representation (in particular, semantic nets and frames) taken from the Artificial Intelligence theory to realize integration mechanisms among knowledge, our theoretical didactic results might have practical application for coordinated and consistent projecting of modular structure of subjects on all levels of formation of education content.

Such an approach might help to solve some important didactic problems of education like: forming students' holistic knowledge system of optimal information capacity capable to be used flexibly in related branches; automatic control of cognitive processes in education; creating optimal educational trajectory from the standpoint both of a student and the situation on labour-market; determination of equivalence degree of related specialities and others. Solving these problems seem to be beneficial from the perspectives of facilitating public professional and social mobility; education services delivery arrangements; developing optimal hybrid forms of education provision and governance; promoting searching adequate mechanisms of widening range of educational service regulation and others.

Our projecting technology also includes determination the kind and type of expertise for the subject modular structure designed on the basis of scientific knowledge integration: internal scientific-methodical expertise of the pedagogical project by the models of estimate and diagnostic types. Appropriate criteria system was developed for the expertise of each model practical realization.

With the aim of verification of the designed projecting technology on the basis of scientific knowledge integration empirical investigation was carried out which proved high quality of the ready-made project as well as its positive influence on the planning and results of academic process.

Thus, from the standpoints of the

perspectives of the presented research it would be interesting and relevant to investigate and to discuss with academics and educators-practitioners some range of issues.

Firstly, it is to investigate coordinated interaction of public and private professional education from the standpoint of a student as he/she can vary forms and places of education during long life learning, should have an opportunity to change his/her educational trajectories in terms of globalization and economical integration, to re-learn, to improve own skills, to adapt to new economical conditions etc. It is important to develop different mechanisms of such interaction.

Secondly, such coordinated interaction naturally demands coordinated curriculum forming on different levels of education in order to provide for a student educational and social mobility mentioned above. Thus, it seems to be important to create several means of coordinated curriculum forming, to apply them, to compare their effectiveness etc.

Also it would be beneficial to estimate the role of information and communication technologies in facilitating the coordination, governance and provision of education services, to consider the ways of using their great didactic and economic potential for delivery of education service of high quality, high degree of availability and access.

References:

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