METHOD OF PROJECTS IN THEORY LEARNING OF A FUTURE AGRICULTURAL ENGINEER

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Summary. New educational standards involve significant changes in the structure, content, aim and tasks of education. The article deals with the results of investigation of peculiarities of the method of projects usage in the theory of teaching a future agricultural engineer in higher education institutions. The method of projects in educational technologies provides solving an agricultural problem and it is directed into achieving a specific result that can be publicly presented and transferred to a customer. The main achievement is a creative research project that demands integrated knowledge, investigation for getting significant results of theoretical and cognitive character and practical character. Such project should be vital according to the chosen topic, problems and tasks, methods of investigation, sources of information, hypothesis and ways of solving the given problem.

Keywords: theory, training, method of project, activity, future agricultural engineer.

Introduction.

Competitiveness of an agricultural engineer at the labor market depends on the level of special basic education, fundamental knowledge, capacity for steady self-development, obtaining new competence, professional mastering of innovative technologies, adaptation to constant changes in agribusiness.

Domestic educational system responds to social and economic development tendencies and proposes European integrated conceptual ideas of competence oriented education. The economic development of society, increasing in material well-being of people are based on thorough and fundamental general science and special professional knowledge. To get this knowledge a future agricultural engineer expert should acquire to think creatively, cogitate pragmatic categories, and predict the result at the start-up period of implementing ideas and projects. Moreover, such an expert should be able to associate with colleagues, to work in team, to determine priorities, to plan a shop-floor activity, to bear personal responsibility for project implementation, to use computer equipment and information technologies effectively.

Prerequisites and means for solving the problem. Using the method of projects in theory learning is of current importance because key competences of students are formed and pedagogical tasks are solved giving the opportunity: to learn how to plan a final result and a sequence of actions, to match future work with your potential, time management and economic factors, to use different sources independently, to find and use the right information, to solve problems constructively and to make own choices and decisions. Method of projects is a training system in which students obtain knowledge, skills and competence planning and doing the tasks that are becoming complicated gradually. The project is primarily a form of organization of activities aimed to obtain a specific product. Project-based method allows bringing learning of students to solve practical and socially important tasks.

The term “method” is understood as the logic basis for mode of actions to consciously achieve the intended purpose under circumstance [1].

A work on a project is a logical continuation of profound study of a material. It requires from students to activate various psychological processes such as memory, imagination, and creative thinking. All work aimed on stimulating independent research activities should be formed gradually. Each student's creative work oversees primarily positive emotions and a feeling of being a pioneer or a researcher.

Introducing the pragmatic creative projects into the educational process makes students become interested in the final result of their activity, implementing these results into real farming.

The work on a project starts with the designing the project itself. Compulsory determinant factor of each project is an investigation a student does. The main stages of the project activity are preparation, planning, investigation, receiving and valuation the results, conclusions, and recommendations (Figure 1).

So, a project is passing through all the stages in a consecutive order: determining the problem, planning, designing itself, methodology and algorithms choosing, modeling, estimation and parameter optimization, getting the product (machine, process, technology, etc.), results documenting, illustration designing and its defense, report and working paper execution, and data transfer to a client.

Solution of the examined problem. There are several levels of independent thinking of the technical specialties students in agricultural higher institutions: the first one corresponds with the teaching; the second one is the level of a problem setting by a

teacher and solving the situation together with the students; the third level foresees a student to solve the problem autonomously; the fourth affirms the absolute independence of a student who determines and solves the problem on his/her own.

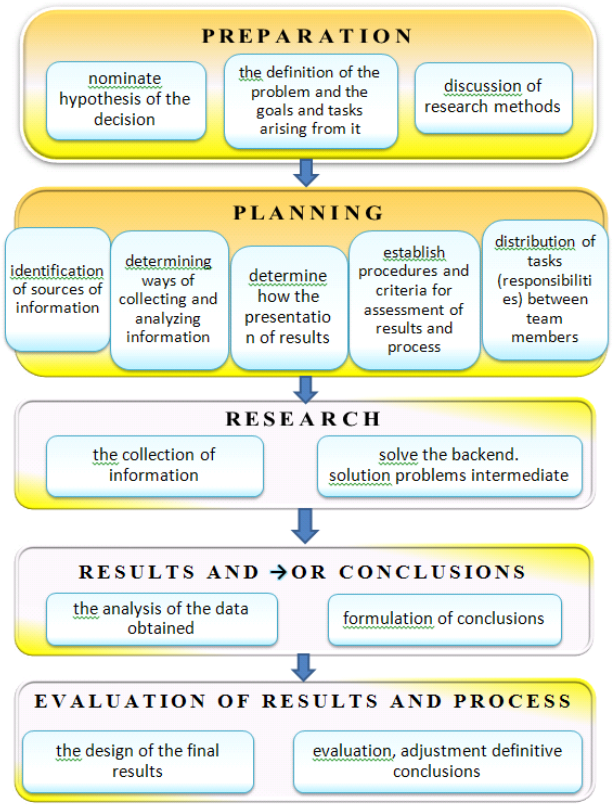

Figure 1. *The Main Stages of a Project Activity*

Educational agricultural engineer projects are characterized by research, creative, role, live-action, information, applied and other typological features, the number of participants, and the terms of the development, etc.

Research projects require well thought-out structure, clearly determined aims, the relevance of the subject of the investigation, economic and social importance, specific theoretical and experimental methods of investigation, and data processing. They are conducted according to the common logical scheme and their structure is close to classic scientific researches.

The general criteria of a student preparedness to work on projects are existence of project type of thinking, the capacity to work in team, performing discipline, strong motivation to participate in a project, high entrepreneurial and social activity, flexibility and capacity to correct one's actions and decisions.

So far, the Standards of Education and the Statute of Ukraine "About Higher Education" declared the realignment of teaching. It is required not just to learn knowledge, capacity and skills, but to develop a personality, his/her talents, and independence of his/her thinking. Research and project work facilitates key competences of students; it takes participants of educational process into real farming out from the walls of the University. Method of projects allows solving the following pedagogical tasks: to teach planning succession of actions, to foresee final results, to match future work with one's potential, time management and economic factors. The project is primarily a form of organization of activities aimed to obtain a specific product. Project-based method allows bringing teaching students to solve practical and socially important tasks. Implementation of projects allows making students more interested in a final result of an activity. A work on a project is a logical continuation of profound study of a material. It requires from students to activate various psychological processes such as memory, imagination, and creative thinking. Different and sometimes even new styles of communication could be possible in this case. It is important to figure out assumptions, options, and hypothesis for students and discuss them in the classroom. The main purpose of a teacher is to create conditions for development of a personality, self-determination and self-realization. It is important to guide students to generalization, to learn not only to solve problems of analysis and synthesis but also to use these concepts as an instrument of cognition.

Projects are divided into individual and group (complex) projects. Individual projects are characterized by the following peculiarities: a program and a plan of the project are made out in consideration of student's concern in the project result; it develops student's individual responsibility and professional competence. Figure 2 represents the scheme of personal project that completes the main course program [2]. It shows the level of student's skills that facilitate effective activity after getting specific knowledge.

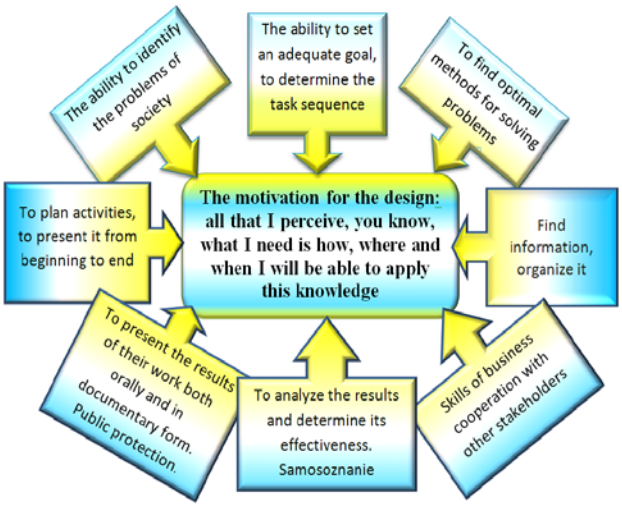

Figure 2. *The Level of Skills Development*

Group projects help to form cooperative skills and thoroughly fulfill the project. In the formation of project activities development of rules for a group work is significant. Each student should feel wanted in the project, able to express his creativity completely and all-around. However, it is not recommended to

demand absolute silence organizing group work because students should exchange their opinion. You should not expect immediate results, and everything should be done in a proper way. It is not necessary to switch to a more complex work until you will learn simple forms of communication, discussion, and solution of specific project agronomic problems. Interacting in a group, students understand that all participants should come to an agreement in order to achieve a common goal. It is important to find the ideal relationship between both students and teachers. It is better to implement the method of projects with students together, listening to them attentively. The project activity on the faculty of agriculture mechanization is conducted from the first course to the last one. A project on planting of bioenergy crops on sloping lands has been written with a group of students.

Group activity is socially oriented.

On the basis of requirements for students' activity in a group, designed by I. Kolesnikova and M. Horchakova-Sybirska, the rules of cooperation were determined. As the scholars say, unconstrained joining to the project and emotional attitude towards the project are indicators of a student's readiness for a project work. While working on the project it is of special importance to consider the activity of both participants and those who are interested in a project development. To raise the quality of a project it's recommended to get qualified experts, teachers, scholars and representatives of agricultural units to join the project [3].

Here are some forbidden items in a group work organization:

- one should not require absolute silence, as students must share their thoughts;

- one should not expect immediate results; everything is digested practically;

- It is not necessary to switch to a more complicated tasks until simple forms of communication aren't learnt.

Interacting in a group students understand that all participants should come to an agreement in order to achieve a common goal. It is important to find the ideal relationship between both students and teachers.

Students of the Faculty of Agricultural Engineering work on projects from the first year to the last. Thus, first-year students under the supervision of teachers developed a project "Optimization of Agricultural Implements Complex for Crofts and Farming". Students got acquainted with structure, management and conditions of agricultural machinery storage. Studying harvester threshers there were held conferences and students presented their projects "Peculiarities of Mechanization of Grain Crops Harvesting Under the Conditions of Native Land". Students themselves made the plan to achieve results, selected materials, worked on supplementary literature and represented their achievements to other students. Teachers provided the students with consultative advice, explained principles how to accumulate innovative information and its processing, and gave actual representing of final product for public speaking.

The third-year students developed the project on preparation of the field and bioenergetic crops sowing on the lands of a little gradient of slopes. The project represents general problems that are important for actual agro-industry [4]. Students worked on the certain elements of considerable problem, they used initial data and scientific achievements of their teachers in the process of working on course and qualification projects and thesis. Moreover, students investigated changes of agrochemical characteristics of soil alongside generatrix slopes that are typical for the region of their residence, peculiarities of functioning mechanical and technical means for sowing bioenergetics crops, represented the techno-economic feasibility of manufacturing process accomplishment.

Results and discussion. The output data of the project is further used by the senior students at the course «Machine Utilization in the Plant Growing Sector» while working on the course and graduation projects. Research project skills are formed gradually. A project develops mental processes during obtaining academic disciplines. Individual educational projects are compulsory in the training curriculum for future experts in agricultural engineering.

Conclusion. New educational standards causes significant changes in the structure, content, aims and tasks of education. Teaching process is provided according to the training curriculum for agriculture engineers. A student is supposed to be oriented on the general research way, be well-educated in the algorithm that helps to solve the given tasks, and manage the process of training activity on his own. One of the ways to make a student a subject of teaching process is to involve him into research project activity as an important didactic way that responds on updated needs of life. It is also supposed a successful student to be a successful agricultural engineer in future who designs and implements innovative projects. Agriculture, 2012. – Vol. 14, No6, 179-182.

References

1. Dietrich J. Design and Construction: A systematic approach / Trans. with Pol. − M .: Mir, 1981. − 456.
2. Bendera I.M. The theory and method of independent work of future specialists in agricultural mechanization in higher education: Dis. ... Dr. ped. Sciences: 13.00.04 − K., 2008. − 579.
3. Kolesnikova I.A., Gorchakova-Sibirskaya M.P. Pedagogical designing. − Moscow: Academy, 2007. − 288.
4. Pryshliak Viktor. Technological and technical bases of sowing biopower cultures on the hill land of small steepness / MOTROL: Motoryzacja i energetyka rolnictwa, Motorization and energetics in agriculture, An international journal on operation of farm and agri-food industry machinery. – Lublin–Rzesów: Mot. and Energ. Rol., Commission of Motorization and Energetic in Agriculture, 2012. – Vol. 14, No 6, 179-182.