The Implementation of Professionally Focused Technology of Training on Energy Saving in Modern Agro-engineering Education

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Summary

Training on energy saving is an important task in agricultural engineering education. Author offers the new kind of competence - competence of energy saving design solutions making (ESDS-e) as mandatory for the agricultural engineers. Autor believes, that this competence should be formed during classes on special disciplines at first. The article considers a new method of training on energy saving. Pedagogic basis of the method is the professionally focused technology of training on energy saving (PFTTES). Scientific basis of the method is the applied theory of energy saving in power technological processes (ATEPTP). The theory describes the energy state of agricultural energy systems taking into account their hierarchy and patterns of interaction between biological objects and artificial habitats. The purpose of this article is to describe the author's experience in training on energy saving within educational process of the agricultural university.

*Key **word: competence, professionally focused technology, training, energy saving***

Introduction.

The main goal of modern agricultural engineering education is to trane competitive professionals. The notion of competitiveness becomes a scientific category in teaching science [Katane, 2010]. A prerequisite for competitiveness is its specialist expertise in energy efficiency, which, in this author's opinion, should be formed primarily in the classroom for special disciplines in accordance with state educational standards.

The term "energy saving" means the implementation of legal, institutional, scientific, industrial, technical and economic measures aimed at the efficient use of energy resources. Accordingly, training on energy saving (TES) should be directed to the formation of energy-saving competence in the marked areas of their professional training [Rakutko, 2014].

The purpose of this article is to describe the author's experience in training on energy saving within educational process of the agricultural university.

Materials and methods.

An experimental base for the study was faculty of electrification and automation of agriculture of the far Eastern State Agrarian University (Blagoveschensk, Russia). In the experimental group was attended 109 students and 146 students in the control group, that allowed the study a comparative analysis of learning outcomes in the implementation of different models of training.

The varying conditions for the control and experimental groups were: 1) the contents of the lecture course; 2) place of practical training (computer or common class room); method of carrying out laboratory studies (with or without computer technology); means of self-study training material (training complex or traditional textbooks), the possibility of self-knowledge of current students; requirements for the course project [Rakutko, 2015].

The constant conditions were: 1) providing equal training information; 2) statement of the same didactic problems solved in the course of training; 3) the same continious of training; 4) the same ways and types of management of the training process and its results; 5) conducting classes with the same teacher.

Results and Discussion.

Dynamics of changes in the ESDS-e of trainees for special discipline «Light Engineering» is presented in figure 1. Dotted line - level of ESDS-e components before training the discipline, solid line - after training the discipline.

The aggregated data shown, that the dynamics of ESDS-e components is characterized by considerable growth and sufficient balance. Thus, changing motivational component was observed from 48 % to 92 % (in 1.9 times), cognitive component - from 33 % to 76 % (in 2.3 times), activity component - from 30 % to 54 % (in 1.8 times), reflexive component - from 34 % to 55 % (in 1.6 times).

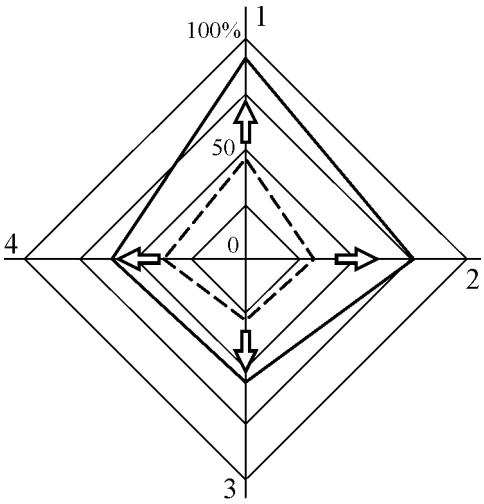

Fig. 1. Summary chart of dynamics of the ESDS-e components (%%): 1 - motivation; 2 - cognitive; 3 activity; 4 - reflective.

Pedagogic experiment have demonstrated the following results:

1. shortening the duration of the TES - for the second group were required additional individual classes on energy saving, unlike the first, what extended training in the relevant discipline;

2. achievment the objectives the training process - the usage of PFTTES provide a higher average grade, that indicates better quality of education, expressed in the form of established competence on energy saving;

3) increasing the efficiency of management of technological training process achieved through the application the ISTES, that allow algorithms and software and hardware implementation.

In addition, the proposed TES provides a self-organizing stream of fragments of knowledge bases on special disciplines and energy saving, continuously replenished the ISTES.

The obtained results allow us to establish the sustainable pedagogical effect of use the PFTTES.

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