

SPECIALISTS FOR FUTURE ENGINEERS EXPERIMENTAL RESEARCH OF TEACHING

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Abstract. *The article presents the results of the experimental research of the scientific research work on improving the teaching of specialized sciences to future agricultural engineers.*

Key words: *methodological, didactic, approach, research, experimental test, model, agriculture, professional activity, quality of education, efficiency, methodology, level, group, respondent, criterion, program, professional activity*

The purpose of the pilot work was to determine the level of effectiveness of methodology and educational methodological support developed on the basis of the design of a modular system of education in specialty disciplines, the formation of methodological approaches and didactic principles and the adequacy of pedagogical conditions in the implementation of the model for the development of professional training of students in the process

Pedagogical experimental and test work was carried out for three years at the Institute of anti-irrigation and agrotechnologies of the Tikhmmi MTU, the Namangan Institute of engineering and construction and the Bukhara Institute of Natural Resource Management (Table 1).

Pedagogical experimental and test work was carried out to students of the direction "5430100-mechanization of Agriculture-lash". The study involved 412 students.

Pedagogical experimental test work was carried out in three stages:

Stage 1. In the process of teaching specialty subjects to future agricultural engineers of the stage of identification and preparation, pedagogical activity was organized, aimed at determining the level of development of professional competence and readiness for professional activities.

Stage 2. Implementation at the pilot stage, the organizational pedagogical conditions of the model for the development of professional competence and readiness for professional activities in the process of teaching specialty subjects to future agricultural engineers were established and tested.

Stage 3. At the closing stage, the results of the experimental work were summed up, the results were revised, the data from the experiment was systematized, a mathematical-statistical analysis was carried out, and the results of the work were formalized.

Pedagogical experiment-pedagogical model and methodology developed as a result of research was implemented in the test work. Also, feedback from future agricultural industry professionals involved in pedagogical pilot work was studied, interviews were conducted

with the aim of generating confidence in the increased quality and effectiveness of Education.

Table 1.

Institutions of Higher Education where the experiment was conducted

№	Name of Higher Education Institution	Number of respondents			Total number of respondents to higher education institutions
		2020-2021 school year	2021-2022 school year	2022-2023 school year	
1.	“TIQXMMI” MTU QIAI	67	59	62	188
2.	NamIEC Namangan Institute of engineering and construction	30	28	31	89
3.	BTRBI	46	42	47	135
	Total:	143	129	140	412

Pilot work was carried out in groups that were conditionally designated as an “experimental group” and a “control group”. Experimental work was conducted using the same material and two different methodologies, comparing the activation of professional training in students of both groups. Also, the content of natural-scientific, universal and specialized subjects, the conditions, methods of study were selected, the results of question and answer, pedagogical observation, the criteria for controlling and evaluating students' knowledge were summed up. The results of the control and experimental groups were systematically analyzed and compared with each other, conclusions were drawn.

According to the results of pedagogical experimental and test work carried out at the Institute of counter-irrigation and agrotechnologies of the MTU” TIQXMMI”, the level of training of students for professional activities participating in the experimental group showed a high level of 9.47% at the beginning of the experiment and 21.05% at the end of the experiment. The middle level grew from 17.89% at the beginning of the experiment to 46.32% at the end of the experiment, while the lower level decreased from 72.64% to 32.63% (Table 2).

The training levels for professional activities of their students who participated in the control group showed a high level of 7.53% at the beginning of the experiment and 10.75% at the end of the experiment. The middle level grew from 18.28% at the beginning of the experiment to 26.88% at the end of the experiment, while the lower level decreased from 74.19% to 62.36%.

Table 2

At the Institute of counter-irrigation and agrotechnologies of the MTU “TIQXMMI” results of pedagogical experimental and test work carried out

Professional activity level of Education	Experimental group				Control group			
	95 students at the beginning of the experiment		95 students at the end of the experiment		93 students at the beginning of the experiment		93 students at the end of the experiment	
	Number	%	Number	%	Number	%	Number	%
High	9	9,47	20	21,05	7	7,53	10	10,75
Middle	17	17,89	44	46,32	17	18,28	25	26,88
Low	69	72,64	31	32,63	69	74,19	58	62,36
Total	95	100	95	100,0	93	100,0	93	100,0

The level of professional activity training of students participating in the pilot group showed a 9.09% higher level at the beginning of the experiment and a 20.45% higher level at the end of the experiment. The middle level grew from 18.18% at the beginning of the experiment to 50% at the end of the experiment, while the lower level decreased from 72.73% to 29.55%.

The professional activity training levels of their students who participated in the control group showed an 8.89% higher level at the beginning of the experiment and a 13.33% higher level at the end of the experiment. The middle level grew from 17.78% at the beginning of the experiment to 20% at the end of the experiment, while the lower level decreased from 73.33% to 66.67%.

Namangan Institute of engineering and construction) carried out pedagogical pilot work on 44 students from the experimental group and 45 students from the control group (Table 3).

Table 3.

Results of pedagogical experimental and test work carried out at Namangan engineering and Construction Institute

Professional activity level of Education	Experimental group				Control group			
	44 students at the beginning of the experiment		44 students at the end of the experiment		45 students at the beginning of the experiment		45 students at the end of the experiment	
	Number	%	Number	%	Number	%	Number	%
High	4	9,09	9	20,45	4	8,89	6	13,33
Middle	8	18,18	22	50,00	8	17,78	9	20,00
Low	32	72,73	13	29,55	33	73,33	30	66,67

Total	44	100	44	100	45	100	45	100
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The level of professional activity training of students participating in the pilot group showed an 8.82% higher level at the beginning of the experiment and a 19.12% higher level at the end of the experiment. The middle level grew from 20.59% at the beginning of the experiment to 50.0% at the end of the experiment, while the lower level decreased from 70.59% to 30.88%.

The training levels for professional activities of their students who participated in the control group showed a high level of 7.46% at the beginning of the experiment and 11.94% at the end of the experiment. The middle level grew from 16.42% at the beginning of the experiment to 25.37% at the end of the experiment, while the lower level decreased from 74.62% to 61.19%.

At the Bukhara Institute of Natural Resources Management, pedagogical pilot work was carried out on 5430100-68 students from the experimental group in the direction of undergraduate education “mechanization of Agriculture”, in parallel with 67 students in the control group. In the process of pilot work, the level of preparation of students for professional activities was determined (Table 4).

The level of preparation for professional activities of students participating in the pilot group showed a high level of 9.18% at the beginning of the experiment and 20.29% at the beginning of the experiment. The middle level experienced an increase of 48.31% from 18.84% at the beginning of the experiment, while the lower level decreased from 71.98% to 31.40%.

The training levels for professional activities of their students who participated in the control group showed a high level of 7.80% at the beginning of the experiment and 11.71% at the end of the experiment. The middle level grew from 17.56% at the beginning of the experiment to 24.88% at the end of the experiment, while the lower level decreased from 74.14% to 62.91%.

The pilot work was carried out on the basis of the methodology for increasing the level of training of students for professional activities. On the basis of the emergence of problem situations in training, the organization of controversy, the sharing of students' feedback, the cultivation of their practical activity, the formation of independent decision-making.

Table 4

**Brought to the Bukhara Institute of Natural Resource Management
results of pedagogical experimental and test work**

Professional activity level of Education	Experimental group				Control group			
	68 students at the beginning of the experiment		68 students at the end of the experiment		67 students at the beginning of the experiment		67 students at the end of the experiment	
	number	%	number	%	number	%	number	%

High	6	8,82	13	19,12	6	7,46	8	11,94
Middle	14	20,59	34	50,0	11	16,42	17	25,37
Low	48	70,59	21	30,88	50	74,62	41	61,19
Total	68	100	68	100	67	1100	67	100



Figure 1. Diagram of the results of pedagogical experimental and test work carried out at the Institute of counter-irrigation and agrotechnologies of the MTU" TIQXMMI", Namangan engineering and Construction Institute and Bukhara Institute of Natural Resource Management

The results obtained were analyzed using the criterion of the Student statistics and processed in the Microsoft Excel program.

As a result of our research, at the end of the experimental work, which was selected as all the experimental fields, the effectiveness of the level of training of students in the experimental group for professional activities was 12.1% higher. This indicates that the research work carried out is effective.

LIST OF LITERATURE USED

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