

Improving the Methodology for Forming Students' Practical Competencies in Geography Lessons: Results of A Pedagogical Experiment

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Abstract: The article presents the results of a pedagogical experiment aimed at improving the methodology for developing students' practical competencies in geography lessons. The effectiveness of competency-based, problem-based, project-based and inquiry-based approaches, as well as modern educational technologies, was examined. The results confirmed the effectiveness of the improved methodology in developing students' practical competencies in geography education.

Keywords: Geography education, practical competency, competency-based approach, inquiry-based learning, practical activities, pedagogical experiment, educational technologies.

Introduction: The results of a systematic study and scientific analysis of psychological and pedagogical literature have shown that the problem of developing students' practical competencies in geography lessons within the general education system requires a separate and specialized pedagogical study [1].

METHODS

Experimental work aimed at developing students' practical competencies in geography lessons was carried out in general secondary schools in three stages between 2023 and 2026. In the experimental group, geography lessons were supplemented with targeted pedagogical activities aimed at developing practical competencies, while the control group followed traditional teaching methods. The purpose of the experimental work was to identify and scientifically substantiate a set of effective pedagogical tools, together with the necessary and sufficient conditions, for improving the methodology of developing students' practical competencies in geography education.

To achieve this purpose, the following tasks were set:

- to determine the extent to which students retained the geography knowledge acquired in the previous academic year;

- to determine how far the developed didactic materials and teaching-methodological support contributed to competence development;

- to determine the quality and suitability of the test tasks developed to assess students' general competencies in geography;

- to study the pedagogical conditions created for students in classroom and extracurricular activities;

- to study the dynamics of competence development among students over the course of the academic year;

- to select educational technologies for the effective development of students' practical competencies;

- to test mechanisms for assessing students' level of competence development;

- to develop relevant proposals and recommendations;

- to experimentally verify the pedagogical effectiveness of the developed model and analyse the results.

Data were collected through pedagogical observation, interviews, questionnaires, lesson analysis, review of

school documentation, and expert assessment of students' work products.

To address the research problem, a pedagogical process model was developed that reflects the content of the educational process under conditions of

modernised education and is oriented toward forming students' practical competencies. The model comprises five interconnected components – goal-oriented, methodological, content-didactic, process-technological, and assessment-outcome – as shown in Figure 1.

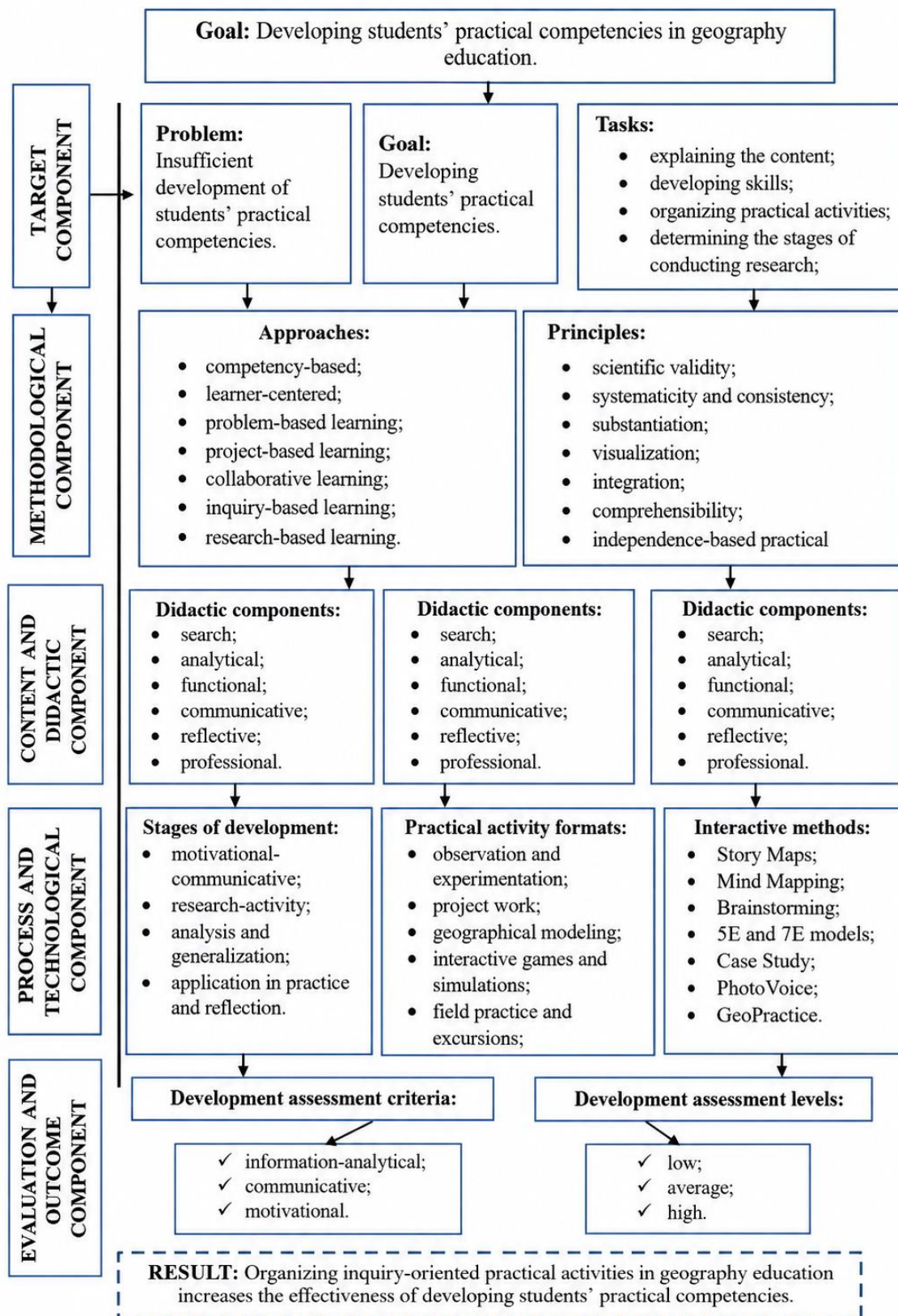


Figure 1. Model of the pedagogical process oriented toward forming students' practical competencies in geography lessons.

The experimental work included test items and theoretical and practical assignments; students' performance was studied and assessed through a combination of formative and summative assessment, using the criteria and level indicators shown in Table 1.

Table 1

Levels of the criteria for assessing the development of students' practical competencies in geography lessons, and their description

Level	Criterion	Description
High	Information-analytical	Independently searches for, analyses and compares geographic information from various sources, makes effective use of maps and statistical data, and draws well-founded conclusions.
	Communicative	Expresses ideas fluently and logically, actively participates in group work, respects the opinions of others, takes part in discussions with evidence, and presents results effectively.
	Motivational	Shows strong interest in geography, completes practical assignments independently and responsibly, and constantly strives to acquire new knowledge.
Average	Information-analytical	Searches for and analyses geographic information with the teacher's assistance, is able to partially use maps and statistical data, and draws simple conclusions.
	Communicative	Generally expresses ideas correctly and participates in group work, but sometimes encounters difficulties in communication and presentation.
	Motivational	Interest in geography is not stable; generally completes practical assignments, sometimes only with the teacher's prompting.
Low	Information-analytical	Cannot search for information independently, has difficulty analysing maps and statistical data, and needs the teacher's help to draw conclusions.
	Communicative	Has difficulty expressing ideas, participates passively in group work, and has not sufficiently developed communication and presentation skills.
	Motivational	Has low interest in geography, is passive in completing practical assignments, and shows insufficient striving for independent work.

RESULTS

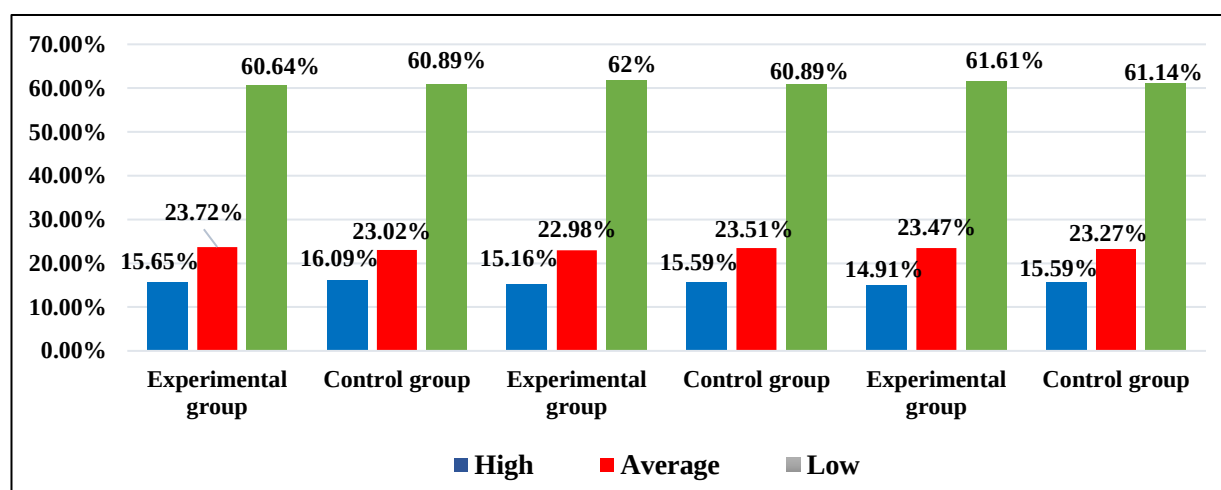
For the information-analytical criterion, the high-level achievement rate at the baseline stage was 15.65% in the experimental group and 16.09% in the control group; the average level was 23.72% and 23.02%, respectively, and the low level accounted for the largest share – 60.64% in the experimental group and 60.89% in the control group. These figures indicate that the corresponding component was underdeveloped in both groups at the start of the experiment.

Analysis of the communicative criterion showed a similar pattern: high-level indicators were 15.16% in the experimental group and 15.59% in the control group; the average level was 22.98% and 23.51%, respectively; and the majority of respondents (61.86% and 60.89%) were at the low level, indicating that the theoretical knowledge underlying practical-

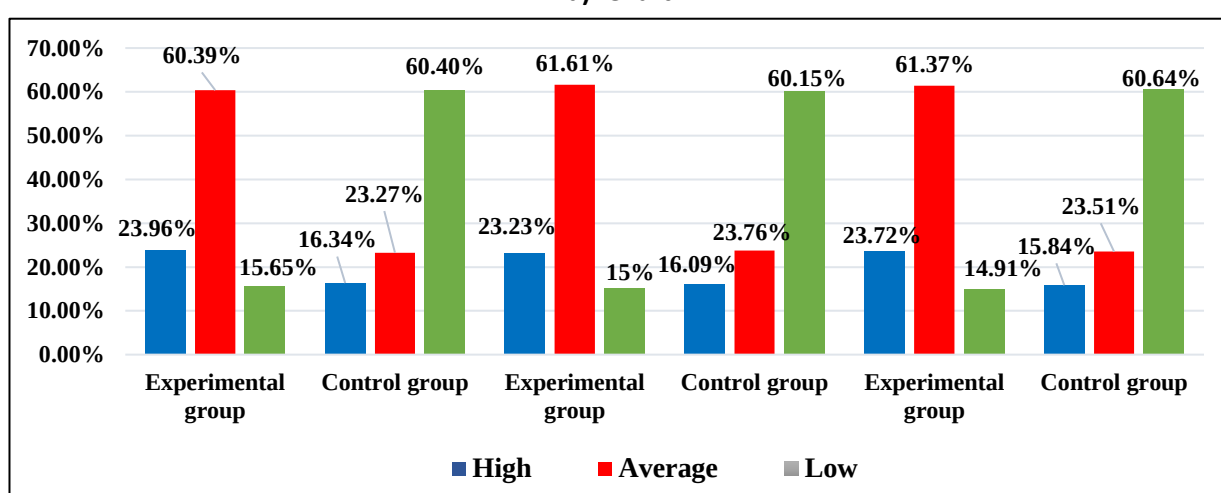
competency formation had not yet been sufficiently developed.

Results for the motivational criterion were similar: the high level was 14.91% in the experimental group and 15.59% in the control group; the average level was 23.47% and 23.27%, respectively; and low-level indicators accounted for 61.61% and 61.14%.

The results of the initial stage of the experimental work showed that low-level achievement indicators prevailed across all criteria—information-analytical, communicative, and motivational. This confirms that the structural components aimed at developing students' practical competencies in geography lessons had not been systematically developed and substantiates the need to introduce the developed methodology into practice.



a). Chart.



b). Chart.

Figure 2. Baseline (a) and final (b) results of the experimental work by criterion (EG = Experimental Group, CG = Control Group)

Results for the motivational criterion were similar: the high level was 14.91% in the experimental group and 15.59% in the control group; the average level was 23.47% and 23.27%, respectively; and low-level indicators accounted for 61.61% and 61.14%.

Across all three criteria, low-level indicators predominated at the baseline stage in both groups, confirming that the components underlying students' practical competencies in geography had not been systematically developed, and substantiating the need to introduce the proposed methodology (Figure 2a).

By the end of the experiment, the experimental group showed a marked shift toward higher achievement

levels across all three criteria, while the control group's distribution remained largely unchanged (Figure 2b). For the information-analytical criterion, the high level in the experimental group rose to 23.96% and the average level to 60.39%, while the low level fell to 15.65%; the corresponding control-group figures were 16.34%, 23.27%, and 60.40%. A similar pattern was observed for the communicative criterion (experimental group: 23.23% high, 61.61% average, 15.16% low; control group: 16.09%, 23.76%, 60.15%) and the motivational criterion (experimental group: 23.72% high, 61.37% average, 14.91% low; control group: 15.84%, 23.51%, 60.64%).

Table 2

Teachers' level of readiness and interest in competency-based geography teaching at the conclusion of the experimental work

Teachers' group	Total number of teachers	Readiness and Interest Levels Based on Monitoring Data					
		High		Average		Low	
		o'qituv-chilar	%	o'qituv-chilar	%	o'qituv-chilar	%

Experimental group	409	214	52%	112	28%	83	20%
Control group	404	116	29%	209	52%	79	19%

The obtained results show that the criterion for assessing teaching effectiveness was greater than one and the criterion for assessing the level of knowledge acquisition was greater than zero. This indicates that achievement in the experimental group was higher than in the control group [2; 3; 4; 5].

Thus, statistical analysis demonstrated the effectiveness of the experimental work conducted to determine the level of development of students' practical competencies in geography lessons.

CONCLUSIONS AND PRACTICAL RECOMMENDATIONS

1. Geography lessons organised on the basis of the improved methodology proved more effective in forming and developing students' practical competencies than traditional teaching methods.

2. Questionnaire results showed that students expressed markedly higher interest in lessons organised around a competency-based approach, practical assignments, problem situations, research activity, and modern pedagogical technologies.

3. In lessons based on the improved methodology, students' skills in working with maps, statistical data, and diagrams, in analysing geographic information, in solving problems, and in applying theoretical knowledge to practical situations developed significantly.

4. The regular use of practical assignments, problem situations, and project- and research-based activities adapted to geography had a positive effect on students' independent thinking, creativity, teamwork, and decision-making competencies.

5. Teacher survey results showed that 214 of 409 teachers (52%) in the experimental group demonstrated a high level of readiness and interest in competency-based geography teaching, compared with 116 of 404 (29%) in the control group; average readiness was recorded for 112 (28%) and 209 (52%) teachers respectively, and low readiness for 83 (20%) and 79 (19%) teachers respectively. These results confirm that readiness and interest were significantly higher in the experimental group and support the practical effectiveness of the developed methodology.

6. Mathematical-statistical analysis using Student's t-test confirmed that the experimental group's practical-competency achievement indicators were 10% higher than the control group's, supporting the scientific validity, reliability, and practical effectiveness of the

developed methodology.

7. Overall, the results demonstrate that integrating modern pedagogical technologies, information-communication technologies, practical assignments, and research-oriented activity in geography lessons is an important didactic condition for effectively forming students' practical competencies.

The effectiveness of the improved methodology aimed at forming students' practical competencies in geography lessons was substantiated through a pedagogical experiment. The coordinated use of practical assignments, problem situations, project and research activities, and modern pedagogical technologies was found to contribute to developing students' skills in analysing geographic information, using maps and statistical data, solving problems, and applying theoretical knowledge in practical situations. The results of the experimental work confirmed the practical effectiveness and reliability of the improved methodology.

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