

System-technological approach to determining the content of the region's geography course

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Abstract—The article contains a statement of the position developed by the team of scientists of the Vologda State University on the content of the course of school regional geography. The article deals with the experience of creating a teaching complex "Geography of the Vologda region" and the generalized results of scientific and methodological developments related to the study of the composition, structure, content of the subject (section). There are explanations and proofs in favor of the results obtained by the authors, tested by the practice of teaching the course "Geography of the Vologda region" at school and University.

Keywords—*regional geography, the content of the subject, educational and methodical complex*

I. INTRODUCTION

The end of XX – the first decade of the XXI century in Russia is characterized by the widespread introduction of the regional component in education. To study the region of residence (region, Republic, area) in most subjects of the Russian Federation, regional educational standards and programs on geography were adopted, educational and methodical complexes were developed, and a large amount of hours was given [1]. In the context of the introduction of Federal state educational standards (FES), the regional component of the study is no longer allocated as such, but the analysis of the main documents – the Standard of education [2], the Law on education [3] and the Fundamental core of the content of General education [4] shows that without studying the geography of the region, the requirements for the results of training cannot be met. The detailed results of this analysis are presented in a number of publications [5-6] and prove that the selection of the content of the regional course (or section in the course of geography of Russia) remains relevant.

The purpose of this study is to summarize the experience of development and implementation of approaches to determining the content of the course of geography of the region, accumulated in the Vologda region. The object of the study is the training course of regional geography, and the subject – the content of the course and the principles of its selection.

The experience of the Vologda oblast in addressing this issue, in our opinion, is remarkable and deserves wide coverage, taking into account the following factors. For the first time in the country in the Vologda region in 1961 the manual for studying of geography of the area [7] was developed and introduced in educational process. In the

1990s, when Russia began to develop regional educational standards, in the Vologda region (one of the few in the country), they were already introduced into the practice of schools, and on their basis a school textbook was prepared and published [8]. In 2013, the Vologda region (one of the first in Russia) published a textbook on regional geography that meets the requirements of the FES [9]. Over a specified period of time all the work on the definition of the content of the geography of the region, the construction of the text part and teaching apparatus teaching materials (9 publications) was conducted on the basis of scientific and educational research of the authors aimed at identifying approaches, development of principles of selection of the course content and logic of presentation, and led to the creation of teaching materials (teaching materials) on the geography of the Vologda region.

II. METHODS

The conceptual basis of the study is the basic provisions of educational standards of different generations in terms of the content of the regional component of education and the hierarchical approach to determining the content of geographical education, formulated by V. P. Maksakovskiy [10]. To solve the tasks set by the authors, we used empirical methods traditionally used in teaching methods, as well as analysis, systematization and generalization of the data.

III. RESULTS

The Federal state educational standard provides for the maximum provision of achievement of both subject, and personal, and met subject results. With regard to the regulation of the content of regional geography, in our opinion, the selection should be based on scientific logic determined by the hierarchy of geographical knowledge, and on fixing the optimally necessary content to be assimilated in order to ensure an increase in the level of education through the expansion and deepening of the content of the Federal component. The studied units of content (concepts, laws, laws, facts, representations, etc.) with this approach should be developed and enriched, which ensures compliance with the principle of continuity of learning. From stage to stage of training educational information is built in accordance with the scientific hierarchy, territorial level and the role that the geography of the region should play in the formation of the system of geographical knowledge. Due to the fact that knowledge (through the methods of their acquisition and assimilation) affect other components of the content of education, their selection should be sufficiently rigid,

reasoned and, to some extent, technological. Thus, the process of selecting the content of the regional geography course should be both systematic and technological at the same time. This is how the content of the "Geography of the Vologda region" was determined from the standpoint of the system-technological approach, and the basic principles of selection applied by the authors of the course can easily adapt to the specifics of any subject of the Russian Federation and be used to develop the content of relevant regional courses in countries close to the Russian education system.

At the initial stage of developing the content of the course in the regional standard on geography of the Vologda region, it was provided for the allocation of two educational areas – "Nature of the region" and "economy of the region" [11]. In the structure of each educational area there are three educational lines, which allow systematizing knowledge on their qualitative originality. The sequence of disclosure and the internal structure of each line are subordinated to the implementation of the principles of learning "from simple to complex", "from single to General", and at the level of high school – and "from General to private".

On the basis of the structure of the content lines, the basic level of presentation of educational material is prescribed and the requirements for the mandatory minimum of training of students are defined. This made it possible to include in the set of requirements not only knowledge, but also skills and experience, the formation of which is possible only through activities. At the same time, to build the educational process in the logic of system-activity and personality-oriented training, the authors of regional standards on geography of the Vologda region proceeded from the content of knowledge, and the activity aspects were "connected" to the knowledge component at the stage of development of the methodological apparatus of textbooks.

One of the conceptual ideas of the development of EMC (educational-methodology complex) in the geography of the Vologda region was the terminological support for the basic course of geography of Russia and a hierarchical approach to the content, which reveals V.P. Maksakovskiy. Taking into account the General objectives of geographical education for regional geography, it is necessary to emphasize two more: 1) concretization of knowledge generated in other geographical courses, 2) formation of a system of knowledge about its region, built at a certain territorial level in the hierarchy of theoretical knowledge mastered at the level of the Federal component. The geography of the region for the final generalization is ideal, since it is within the framework of its study that the final territorial level of knowledge is usually formed. Without such generalization a lot of systems of geographical knowledge are hierarchically incomplete.

Taking into account the requirements for personal and met subject results of education, laid down in the FES, for the geography of the region was selected content that contributes to the formation of different ways of activity and the development of certain qualities of the individual. Since many personal qualities inherent in the requirements for learning outcomes can be formed or developed not through the content components, but through the forms of organization of educational activities, when designing the "Geography of the region", the content was considered in conjunction with the teaching method. This allowed us to

formulate the following conceptual ideas for the selection of content and construction of "Geography of the region" as an academic discipline (or educational section).

1. The selection of scientific geographical content should be carried out in such a way that in all systems of geographical knowledge (in all major topics) regional knowledge has a concretizing character, creates opportunities for systematizing generalization, represents the appropriate hierarchical level of knowledge following the previously studied courses.

2. Formed in different topics of the course new concepts should relate to approximately the same rank of concepts. In General, scientific knowledge should be developed into a well-organized system of knowledge about the region.

3. Empirical knowledge should illustrate the formed theoretical knowledge, create a bright, emotionally attractive image of the region, and also serve for the organization of various types of educational activities.

4. In the selection of all types of knowledge, preference should be given to those that contribute to the development of personal qualities of students and allow the use of problem formulations, initiate value judgments, set tasks of predictive and project nature.

5. The deepening of knowledge should be based on the provision on the ranking of concepts, output to the next hierarchical or territorial (often local) level of knowledge or show new qualities of objects, phenomena and processes with the involvement of intersubjective content.

6. The selected knowledge should be potentially applicable for the consolidation and development of General educational and actual geographical skills, for the assimilation of various types of educational activities, for the solution of various educational tasks. The main result of training should not be the knowledge itself, but the skills of their search, understanding, assimilation and application.

7. End-to-end directions in the content of geography (the integration of the two branches of geography, greening, humanization, economization and practical orientation) should pass through all the systems of knowledge and forming skills.

8. The experience of creative activity should be formed both on the basis of ways of obtaining knowledge, and on providing opportunities for expression and reflection and knowledge, and ways of obtaining them [1].

The construction of the content of the course of regional geography should be based on General geographical ideas about the differentiation of nature, population and economy, the hierarchy of geographical systems, the laws and patterns of development of geographical phenomena, processes and objects, as well as recognized in science theories, the most productive hypotheses and concepts.

Among the common approaches to the definition of the content of geographical education in the first place should take into account the territorial approach, which is N. N. Baranskii and I. A. Witwer called "playing with scale". For the Vologda oblast the authors of the teaching materials used at the regional level, and conditionally call it regional-

subject. The local level, in this case, corresponds to the municipal district and (or) settlement [12]. Since the identification of features of objects, phenomena or processes, as well as the establishment of the entire spectrum of cause-and-effect relationships is possible to the greatest extent in the study of their area or locality, the regional-subject level of the hierarchy is concretized to local-municipal and local-local.

Much theoretical knowledge is consolidated and concretized at the regional-subject or local level. For example, the integrity of the geographical shell is easiest for students to understand at the level of natural complexes of the rank of tracts (local level). Rhythm is better absorbed in the scale of those rhythms (daily and seasonal), in which there are students themselves. Knowledge of zoning are fixed and specified at the expense of deeper learning about the "private" nature of the area, peculiarities of distribution in her climatic elements, zonal soil types, and vegetation, etc. At the level of geography of large regions, which include the Vologda oblast, it is possible to show the differentiation of nature at the level of higher taxa: subzone and provinces.

Laws and laws are closely intertwined with geographical teachings. For example, elements of the doctrine of nature management, disclosed at the level of the region of residence, are better absorbed, because they relate to the environment surrounding each individual student, affect his own interests, affect the quality of life. On the level of study of the soils of the region formed a lot of new, but very specific knowledge about the soil-forming rocks and the mechanical composition of the soil, the subtypes of zonal and intrazonal soils. At the local and regional-subject levels, the plan of EGP characteristics (EGP doctrine) is corrected, it becomes possible to assess not only the meso - but also the micro-level of the geographical location of objects and see its impact on other characteristics of the object, for example, on the planning structure of the city. The doctrine of geographical division of labor is fixed and concretized on local examples and makes it possible to explain the concept of "specialization of the region".

Theories of forecasting and geographical estimates can take a certain place in the course of regional geography at the level of practical development of forecast scenarios of the territory under certain conditions and the use of specific assessment scales and assessment methods. These kinds of project tasks are widely used in the latest edition of the textbook "Geography of the Vologda region" for General Repetition. The theory of physical-geographical zoning on the level of geography in the region goes easy on the hierarchical levels of the concepts of "area – province – landscaped area – the landscaped area."

The formation of the terms of certain concepts, for example, natural-resource potential and territorial combination of natural resources in the study region can pass easier for students than at the global level, country level or part of the continent. From other scientific concepts in regional geography, in our opinion, it is necessary to provide a place for the concept of environmental monitoring, geographical expertise, a unified system of settlement, historical and cultural regions. It is most reasonable to involve these conceptual provisions, forming not so much a system of scientific knowledge as metasubject and personal

learning outcomes. In particular, the concept of historical and cultural regions can serve as a basis for the allocation within the study area of cultural landscapes that differ in the specifics of development, economic activity, architecture and other elements of culture.

A special approach in the study of the geography of the region should be to the development of concepts, especially General. Since the geography of the region is a logical conclusion of the course "Geography of Russia", we are talking about the deepening of knowledge in the case when at the regional level introduced the concept of the appropriate rank, and the concretization, when the theoretical knowledge of the basic course is confirmed and illustrated by examples, figures and facts without the formation of new theoretical knowledge. V. P. Maksakovskiy, evaluating the formation in the school of geography of major groups of concepts [11], has drawn attention to the fact that in each geographic rate average 12-13 introduces new concepts of the first rank. Probably, the quantitative order of introduction and concepts of other ranks should correspond to the first. Therefore, the course "Geography of the Vologda region" introduced 15 concepts corresponding to the regional-subject level, for example, glacial relief, karst relief, agro-climatic region, Physical-geographical areas and districts, etc.

In General, the formation of theoretical knowledge in the courses of regional geography leads to the completion of the formation of the basic systems of geographical knowledge. For example, the analysis of the formation of the system of knowledge about territorial forms of nature protection in school geography courses [14] shows that the studied forms of protection correspond to the rank of the studied territory. In the 7th grade in the study of geography of continents and oceans, where the main objects of study are, as a rule, whole continents, sometimes – natural areas, and the "small" object – the country, of the territorial forms of nature protection are considered national parks. Study of geography of Russia in grades 8 and 9, where the largest object is the country, from the forms of nature protection is studied national parks and reserves – specially protected natural areas (SPNA) with Federal status. The hierarchical pyramid of forms of nature protection is completed at the regional and local level and their study takes place at the same levels as the majority of territorial forms of nature protection have a regional or municipal status (nature reserves, natural monuments, etc.). Acquaintance with a large number of regional protected areas is carried out on the basis of typological and selective approaches to the content.

Regulation of the introduction of single concepts is more difficult, especially since many of them are used only as examples and do not require memorization and accurate knowledge of definitions. Individual concepts largely overlap with the nomenclature, leaving the category of theoretical knowledge in the category of empirical. We consider and regulate them in this capacity.

From empirical knowledge in the content of the course are usually characterized by representations, facts and objects (nomenclature). Content selection submissions are often given less attention, as they are usually formed in parallel with concepts and therefore it is not always appropriate to prescribe them separately. In our view, this approach applies to the course of regional geography, needs clarification. If we

consider that the new theoretical knowledge at the level of concepts, laws, laws, etc. little is formed, the formation of new ideas or the specification of existing ones becomes a very important process. Especially as many representations, connecting with theoretical knowledge, form an image of the region.

For example, in the topic "Geological history and geological structure" introduced ideas about the glaciation of Quaternary time and the boundaries of their distribution, information about the block structure of the Foundation platform and the features of the sedimentary cover in connection with the history of formation. Ideas about the impact of glaciation on the development of relief are given in the topic "Relief". Because of the uniqueness of the basin structure of the region in the theme "General characteristics of inland waters" introduces knowledge of the global basins and watersheds, trails and waterways, and because of the peculiarities of the geological history of the ideas of Vologda Poozerye, disappearing karst lakes and rivers.

As you can see, knowledge at the level of representations is formed significantly more than at the level of concepts. And if we apply the method of ranking to the representations, then almost all of them correspond to the regional-subject level.

Rather strict regulation in the regional course of geography, in our opinion, require facts and objects, reflected, in particular, in the list of geographical nomenclature. Facts in the study of their field introduced a lot, but to give to remember, we believe the right limited and strictly verified minimum. Namely: date of formation of the subject of Federation (year), area (rounded), population (rounded), geographical latitude of the Central point or administrative center (for example, the Vologda region intersects in the middle of 60° n), the maximum height above sea level and the name of the form of relief, the average temperature of January and July for the regional center, the name of the longest river, the name of the largest lake, the list of branches of specialization of the region, the number of municipalities. The General list, therefore, contains 12 facts, the assimilation of which will not be difficult for students.

Regulation of the nomenclature is of great importance, since its unreasonable number can greatly increase the load on students, and on the contrary, the optimal list will help to reflect the image of the region as much as possible and emphasize the specific features of its nature and economy, without overloading students [15]. We have identified some common approaches to the selection of nomenclature in the course of geography of the region. Nomenclature is a kind of spatial representations that reflect the mutual location of the most important objects that create a generalized image of the region as a whole or are part of many other images (representations). The list should not be overloaded; this can be achieved by a formal criterion of the ratio of the number of objects and the area of the territory. In the course of geography of the Vologda region we have adopted the norm – one object of each category (rivers, lakes, landforms) on the territory of 100 km². Since a number of objects lies not only within the Vologda oblast, but also in neighboring regions, adjustments have been introduced taking into account the length of the boundary of the region at the rate of one object per 500 km. As a result, the rules of the list –

about 20 objects of each category. In total, a list of 60 objects was obtained, and at least half of the objects are familiar to students at the time of studying the course, so the list does not look excessive.

Information approach to the selection of objects for study involves the inclusion in the list of those that carry a certain information load and participate in the creation of the image of the region. At the first stage of selection we used quantitative (dimensional) indicators: area and height – for landforms, area – for lakes, length – for rivers. At the following stages, other significant indicators were used to reduce the lists and to reflect the specifics of the Vologda oblast as much as possible. For example, the list includes only rivers that form regional pools, the main rivers of the landscape areas and river with the transport value. At selection of lakes which in the Vologda region are more than 5000, involved those that are connected with ancient cities, monasteries, and reflect an image of the region.

The list of mandatory memorization of economic and geographical objects is easier to make. It should include the administrative centers of the districts, the largest centers of industrial production (by industry), transport routes of Federal and international importance. In our opinion, such a quantitative and qualitative approach to the definition of the list of nomenclature is quite objective. It maximally reflects the image of the region and emphasizes the specific features of its nature and economy and can be adopted as an algorithm for determining the list of nomenclature in the study of geography of any subject of the Russian Federation.

IV. DISCUSSION

The system-technological approach used by the authors to determine the content of the course "Geography of the Vologda region" is based on a hierarchical approach to determining the content and determines the basic principles of selection of theoretical and empirical knowledge generated in the regional course. Theoretical knowledge should be selected on the basis of geographical logic, the principles of generalizing repetition and taking into account the necessary minimum content. Empirical knowledge is also selected on the basis of the minimum justified amount, but taking into account the information content to illustrate the theoretical knowledge and the formation of the image of the region.

Thus, the system-technology approach emphasizes the role of regional information in shaping the whole system of geographical knowledge. It is a tool for selecting the content of the regional course, logically linking all levels of education, so it can be used to build a similar course for any subject of the Federation, which, if widely implemented, will talk about the unity of approaches to the selection of the content of the regional component. Testing and implementation of the results of the study in the educational process of schools of the Vologda region for more than 20 years convincingly prove the viability and effectiveness of our approach.

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