

To Improve and Analyze the Teaching Methodology of “High Plants Module” in Botany for Future Biologists

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Abstract: The paper involves the data about teaching methodology of Botany science such as “Higher plants”, the improvement of the content of educational programs and textbooks in education, especially the determination of its structural structure with new content, revision of the arrangement of educational materials according to sections and topics, analysis of the main factors of the educational and educational process. To properly organize independent education for mastering the section and topics of the higher plants module, which students in the higher education system take for the second year of botany, to determine the electronic educational tools created according to the educational module, and to revise them based on demand were analyzed based on the experiences.

Keywords: Education, Factors, Influence, Structure, Module, Concept, High Plants, Experiment.

1. Introduction

In world educational institutions, scientific researches are being carried out on the development of students' intelligence and creativity in the field of biology, practical manifestation of their talent, formation of collective creativity, individual approach from the point of view of science, the use of innovative technologies in place of the module and achieving effective results, development of creative abilities. The new concept of education until 2030, adopted by international organizations and developed countries, states: “Education is the main driving force of development and an important activity leading to the goals of sustainable development”. Practical work is being carried out on the use of modern pedagogical technologies to provide high-quality education to students, as well as to develop students' competences from the point of view of science at a high level, and to define promising directions for modeling the educational process. Today, special attention is paid to scientific research on the use of non-standard tests in botany, the use of biological dictation, graphic organizers, the creation of video materials, the development of students' psychological characteristics, creativity, professional communication skills, and the formation of students' abilities to organize independent education. In the reforms carried out in recent years in our republic, legal foundations are being formed to support the spiritual, intellectual, physical and moral development of future specialists, to provide open and high-quality education for young people, to ensure that young people receive excellent education at all stages of education, to support and encourage talented and talented young people. For this reason, increasing the competence of students in botany, becoming mature experts of their profession in the future, and developing the promising directions of botany in our country, the tasks defined in the development strategy of the new Uzbekistan occupy an important place. Following scientists such as O.Mavlonov, J.O.Tolipova, G.S.Ergasheva, G.A.Shakhmurova,

U.E.Rakhmatov studied the data on improving the methodology of teaching biology in the Republic of Uzbekistan by means of pedagogical and information technologies; A. Abdugadirov, S.S. Babadjonov, N.N. Azizkhodjaeva, U.Sh. Begimkulov, Sh.S. Sharipov studied materials on the implementation of pedagogical and information technologies in educational practice in higher education institutions; R.G.Isyanov, N.A.Muslimov, O'.Q.Tolipov, M.B.Urazova gave materials on improving the processes of preparing students for professional activity; possibilities of using information technologies in the educational process were given by M.Aripov, T.Rikhsiboev, M.E.Mamarajabov, N.I.Tailakov, D.Toshtemirov, S.Q.Tursunov, A.Hayitov, T.Shoymardonov, U.Yuldashev, A. Eminov's research works [1,2,3]. Current trends in the development of biological and environmental education in the research of scientists of the CIS countries by S.V. Alekseev, A.P. Belyaeva, M.A. Danilov, V.V. Kraevskii, N.E. Kuznetsova, I.N. Ponomareva were studied; systematic, complex and personal-active approaches were carried out on the concept of the integrity of the educational process by N.D. Andreeva, P.I. Borovitsky, A.V. Bukhvalov, N.M. Verzilin, L.P. Viktorova, B.V. Vsesvyatsky, M.A. Danilov, N.V. Dobretsova, A.N. Zakhlebnyy, I.D. Zverev, V.M. Korsunskaya, A.N. Myagkova, V.V. Pasechnik, B.V. Polovtsov, I.N. Ponomareva, B.E. Rykov, N.A. Rykov, E.A. Galkina, N.M. Gorlenko, T.M. Efimova, I.D. Zverev, B.D. Komissarov, A.I. Nikishov, L.V. Simonova, S.V. Sumatovin, L.N. Sukhorukova, A.V. Teremov, K.V. Khaibulina, V.F. Shatalov, D.E. Serovayskaya, M.A. The works devoted to the teaching methodology of biology are highlighted. Effective research on the use of interactive methods in science education in developed countries were studied by A. Bork, S. Goodman, M. K. Clemence, D. Sligh, D. R. Hershey A. Hart, L. Henderson, J. Clemen, S. Hennessy, J. Huppert, S. M. Done by Lomask, Diego Tavares Vasquez, Kelma Freitas, Suzana Ursi, João Rodrigo Santos da Silva, Fernando Guimarães, Paulo Takeo Sano, R. Lazarowitz [5].

The purpose of the study

It consists in the development of recommendations for improving the teaching methodology of the module of higher plants in higher educational institutions.

Tasks of the research

to determine the pedagogical and psychological possibilities of teaching higher plants module in higher education institutions; scientific justification and improvement of the teaching methodology of higher plants module in higher educational institutions. improvement of the model for the development of the methodology of studying the module of higher plants; conducting a pedagogical experiment, analyzing its results, and determining the effectiveness of the research work.

2. Research methods

Theoretical (analytical synthesis, comparative-comparison, analogy), diagnostic (surveys, testing, observation, designed methods), pedagogical experiment and mathematical methods (statistical processing of data, graphical representation of results, etc.) were used in the research process.

The scientific novelty of the research is as follows:

Pedagogical and psychological possibilities of teaching higher plants module in higher educational institutions are determined based on consideration of the culture of flexibility with competitive, critical thinking consisting of organizational-methodical, educational-pedagogical, technical, information-educational and methodical components; criteria for evaluating pedagogical professional training skills have been improved based on the mechanism built on the priority of explanatory-motivational, cognitive, technological, creative criteria. in higher educational institutions, the methodological structure of the Higher Plants module teaching process (organizational, goal-oriented, logical-structural, diagnostic-resultative) has been improved by ensuring direct integration with professional formation; The methodical system of teaching the higher plants module in botany has been improved based on the systematization of the possibilities of using interactive software tools (interactive resources, virtual laboratories, crosswords, intellectual games). In the section of the study called "Theoretical foundations of teaching the module" of "Higher plants", the improvement of the content of educational programs and textbooks in education, especially the determination of its structural structure with new content, revision of the arrangement of educational materials according to sections and topics, analysis of

the main factors of the educational and educational process was analyzed based on the experiences of scientists. Among the requirements for the organization of modern education, it is important to properly organize independent education for mastering the section and topics of the higher plants module, which students in the higher education system take for the second year of botany, to determine the electronic educational tools created according to the educational module, and to revise them based on demand. During the research scientists such as A. Abdugadirov, S.S. Babadjonov, N.N. Azizkhodjaeva, U.Sh. Begimkulov, Sh.S. Sharipov, who worked and are working in the Republic of Uzbekistan studied the materials on the implementation of pedagogical and information technologies in educational practice in higher education institutions; R.G.Isyanov, N.A.Muslimov, U.Tolipov, M.B.Urazova gave materials on improving the processes of preparing students for professional activity; possibilities of using information technologies in the educational process were studied by M.Aripov, T.Rikhsiboev, M.E.Mamarajabov, N.I.Tailakov, D.Toshtemirov, S.Q.Tursunov, A.Hayitov, T.Shoymardonov, U.Yuldashev, A. Eminov's research works, and their works were analyzed.

The required interactivity, visibility, mobility, compactness and low cost of their reproduction, which are required today, provide multivariate, multi-level and large volume of tasks and tests for verification. S. V. Alekseev, A. P. Belyaeva, M. A. Danilov, V. V. Kraevskiy, N. E. Kuznetsova, I. N. Ponomareva worked on current trends in the development of biological and environmental education; systematic, complex and personal-active approaches and on the concept of the integrity of the educational process. The works of N.D. Andreeva, P.I. Borovitsky, A.V. Bukhvalov, N.M. Verzilin, L.P. Viktorova, B.V. Vsesvyatsky, M.A. Danilov, N.V. Dobretsova, A.N. Zakhlebnyy, I.D. Zverev, V.M. Korsunskaya, A.N. Myagkova, V.V. Pasechnik, B.V. Polovtsov, I.N. Ponomareva, B.E. Rykov, N.A. Rykov, E.A. Galkina, N.M. Gorlenko, T.M. Efimova, I.D. Zverev, B.D. Komissarov, A.I. Nikishov, L.V. Simonova, S.V. Sumatovin, L.N. Sukhorukova, A.V. Teremov, K.V. Khaibulina, V.F. Shatalov, D.E. and M.A. Serovayskaya were devoted to the teaching methodology of biology. N.M. Verzilin reveals the didactic principles of teaching (defining the place of the lesson among other lessons, the compliance of the lesson content with the curriculum and the preparation of students, the selection of effective methods and tools of teaching, the existence of interdisciplinarity), psychological and pedagogical (memory, attention and formation of thinking, education of moral qualities of a person, development of cognitive interests and motives, development of creative abilities, creation of a problem situation), organizational requirements for the lesson (the presence of a well-thought-out plan of the lesson, accuracy of the lesson (in accordance with the structure of the lesson), creation of work discipline, educational tools and information use, technology, completion of the lesson, its flexibility and mobility). A.N. Zakhlebnyi reflects on the description of the theoretical and methodological aspects of the study of the selected problem, reveals the interrelationships between subject and macrosystemic knowledge. D.E. Serovayskaya studies how to prepare instructional materials for the development of creativity, how to predict students' abilities in teaching biology and how to eliminate deficiencies. For a biology teacher, the problem of motivation in working with students is considered important. Development of creative abilities is impossible without internal motivation of students. Effective use of the teacher's cooperation with the student and life experience in demonstrating student motivation; answers, contradictions and problems to be solved together with the teacher; work in small groups on problem tasks; biological modeling processes; creative projects; deep analytical conclusions about the integration process of biology with other sciences play an important role in the effective organization of the lesson.

Diego Tavares Vásquez, Kelma Freitas, Suzana Ursi developed the students' proposals for didactic strategies in groups, which at the end of the week will be followed by an oral question-and-answer session on botany. Students' responses to the topics discussed are grouped into three groups: strategies, methodologies, and confidence in teaching. Dr. Hershey approaches the problems of botany teaching from a historical perspective and mentions the importance of the role of motivation in improving the quality of teaching. João Rodrigo Santos da Silva, Fernando Guimarães, Paulo Takeo Sano are interested in the concepts and perceptions of teaching and how to teach students, mainly the perceptions of prospective teachers. "How should I conduct lessons on a specific topic? What should I do in class? How should I handle personal differences?" They reveal that such questions arise in the process of training teachers and discuss them during the topics of the curriculum.

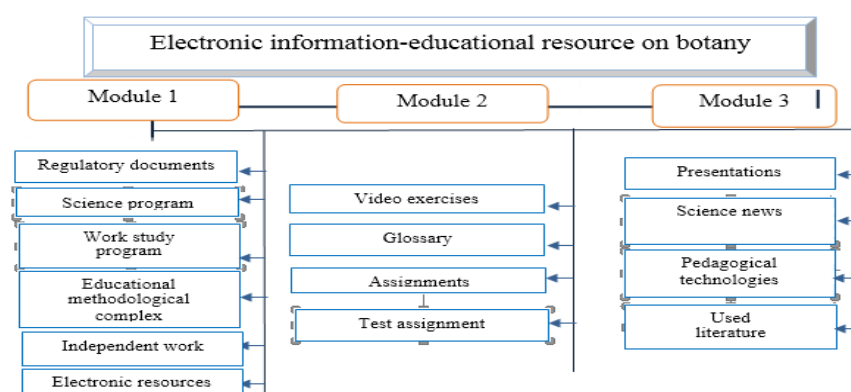


Figure 1. Electronic information-educational resource on botany

This electronic information-educational resource on botany allows students to learn topics from a computer using text, video, animations, answer test questions corresponding to the topic and receive individual evaluations, theoretical information, definitions and concepts relevant to each topic, an explanatory dictionary of terms in electronic form, presentation creates opportunities for learning with the help of slides (Figure 1). It creates methodical opportunities for obtaining methodological instructions for teaching the science of “Botany”, using theoretical, practical, laboratory training developments, visual presentation slides, video guides, graded test and control questionnaires for student evaluation. In the model incorporating the improved methodical support of “Botany” science, a direction was given for the teaching of the Higher Plants module. This helps students to form perspective motivation, acquire professional knowledge, see their future activities and their place in society (Figure 2).

3. Conclusion

Model of higher education institutions on botany science are directed to organize higher plants module training for biology students. Organization of higher education institutions on teaching biology students using educational technologies (case studies, modular, problem-based teaching, work in small groups, interactive methods, etc.) introduced in the practice of teaching science. Students were able to search for information related to their specialty on the Internet, use local and foreign literature sources, and complete professional assignments through new interactive methods.

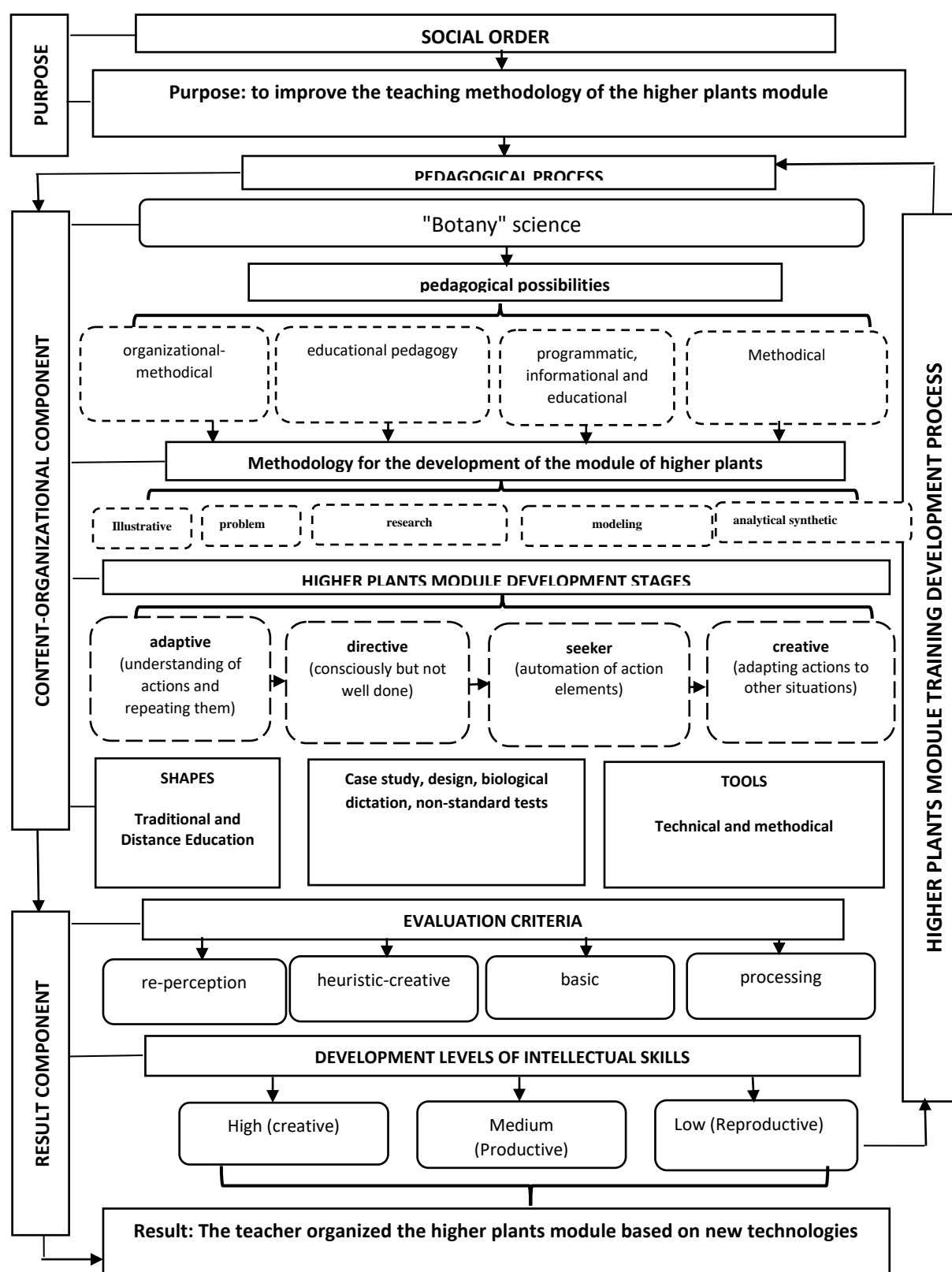


Figure 2. Teaching model of higher education module in botany

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