

The course "Morphology of Plants" as means of activization of students – biologists' self-education

Bakhytzhama Bagustarovna Gabdulhaeva, Muhametkali Kalimovich Zhakupov, Gulsara Kanatkyzy Darzhuman, Saltanat Zhumabaevna Kabieva, Bibenur Askarovna Baidalinova

Pavlodar State Pedagogical Institute, Pavlodar, Kazakhstan

Abstract. In article the essence of self-education of students-biologists on the basis of the theoretical analysis of a readiness of a problem in the theory and practice is defined. Self-education of students biologists is a process and result of development in students biologists of abilities of statement of a self-educational educational task; realization of self-educational educational actions and operations; self-checking behind a course of the solution of a self-educational educational task and self-image of result. The course "Morphology of Plants" locates in work as means of activization of students – biologists' self-education. The Model of self-education of students-biologists taking into account pedagogical conditions of its activization is developed through the course "Morphology of Plants".

[Gabdulhaeva B.B., Zhakupov M.K., Darzhuman G.K., Kabieva S.Z., Baidalinova B.A. **The course "Morphology of Plants" as means of activization of students – biologists' self-education.** *Life Sci J* 2014;11(5s):267-271] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 52

Keywords: self-education of students biologists, pedagogical conditions of activization of self-education of students biologists, the course "Morphology of Plants", as means of activization of students – biologists' self-education.

Introduction

One of essential problems of vocational training of students - biologists is a problem of the organization of work on development of different types of activity the important place among which borrows self-educational, necessary for high-quality preparation of students biologists for future professional activity.

The importance of biological disciplines, including the course "Morphology of Plants" as means of activization of students – biologists' self-education, for development of self-educational activity of students biologists is defined by that level and quality of biological education are one of the main indicators of the general and special preparation of future teacher of biology, including course "Morphology of Plants" as means of activization of students – biologists' self-education.

The problem of activization of self-education of students of higher education institution is investigated in works Pasechnik, V.V.[1, p.11], Frank, X. Sutman [2, p.89], Marissa Harle, Marcy H. Towns [3, p.369], Karl Steffens [4, p.353], Thomas Eberlein, Jack Kampmeier, Vicky Minderhout, Richard S. Moog, Terry Platt, Pratibha Varman-Nelson and Harold B. White [5, p.262], Harold B. White, Marilee A. Benore, Takita F. Sumter, Benjamin D. Caldwell and Ellis Bell [6, p.297], Sakenov, D. Zh. [7, p.1431], Tracey Arnold Murray, Pamela Higgins, Vicky Minderhout and Jennifer Loertscher [8, p.405], Michael F. Antolin, Kristin P. Jenkins, Carl T. Bergstrom, Bernard J. Crespi, Subhajyoti De, Angela Hancock, Kathryn A. Hanley, Thomas R. Meagher, Andres Moreno-Estrada, Randolph M.

Nesse, Gilbert S. Omenn and Stephen C. Stearns [9, p.1991], Schantz, E.A. [10, p.383], Dornan, T., Carroll, C., Parboosingh, J. [11, p.767], Aviv Shachak, Sara Fine [12, p.719] etc. At all variety of researches, the problem of activization of self-education of students-biologists as future teachers of biology was not a subject of concrete pedagogical research.

The analysis of researches of Pasechnik, V.V.[1, p.11], Frank, X. Sutman [2, p.89], Karl Steffens [4, p.353], Sakenov, D. Zh. [7, p.1431], Schantz, E.A. [10, p.383], Dornan, T., Carroll, C., Parboosingh, J. [11, p.767], Aviv Shachak, Sara Fine [12, p.719] allows us to note that innovative reference points of development of the higher education, staticize value of self-education, need of search in practice of preparation of future teacher of biology of such approaches which are directed on development of self-organizing, initiative, independence in decisions and actions, the problem of justification of pedagogical conditions of activization of self-education of students- biologists in this regard is staticized, including course "Morphology of Plants" as means of activization of students – biologists' self-education.

Self-education of students biologists through the course "Morphology of Plants" is a process and result of development in students-biologists of abilities of statement of a self-educational educational task; realization of self-educational educational actions and operations; self-checking behind a course of the solution of a self-educational educational task and self-image of result.

In our opinion, self-education of students-biologists includes the following structural components: motivational, substantial, activity.

The carried-out analysis of a status of a readiness of a problem of activation of self-education of students-biologists allowed to reveal the following contradictions:

- between the realization of the purpose of vocational training of students-biologists assuming a formation at students-biologists of abilities of self-education and established practices of vocational training of experts in pedagogical higher education institution;

- between requirement of activation of self-education of students-biologists on the one hand, and lack of a technique and the technologies causing productivity of self-education of students biologists.

Proceeding from an urgency and contradictions the Research objective is development, theoretical justification and experimental check of pedagogical conditions of activation of self-education of students biologists through the course "Morphology of Plants".

Methods

For the solution of a goal of research the following methods were used:

- the theoretical: studying of biological, psychological and pedagogical literature, the analysis and synthesis of received information on a research problem, pedagogical modeling;

- the empirical: questioning, testing, conversation, natural experiment, analysis and synthesis of pedagogical experience, analysis of documentation and results of activity of teachers;

- methods of mathematical statistics: ranging method, method of an expert assessment.

Main part

Self-education of students-biologists through the course "Morphology of Plants" is a process and result of development in students- biologists of abilities of statement of a self-educational educational task; realization of self-educational educational actions and operations; self-checking behind a course of the solution of a self-educational educational task and self-image of result.

The course "Morphology of Plants" gives concept about the general principles of the organization of plants: in it features of an external and internal structure of plants and their bodies, features of reproduction and individual development are considered. One of the main objectives of a course – formation of a scientific view on processes of formation and development of vegetable

organisms, ideas of adaptive nature of evolution of the vegetable structures, allowed plants to master various ecological niches. The morphology of plants is a necessary basis for such general biological disciplines, as systematization, physiology, plant ecology, plant geography and some other, and also for educational the practices and special practical works.

In our opinion, self-education of students-biologists includes the following structural components: motivational, substantial, activity.

On the basis of the given components of self-education of students-biologists we allocated competences of self-educational activity of students-biologists: educational, research, organizational, social and educational and technological which are the generalized indicators of activation of self-education of students-biologists.

These components of self-education of students-biologists define levels and criteria of their formation.

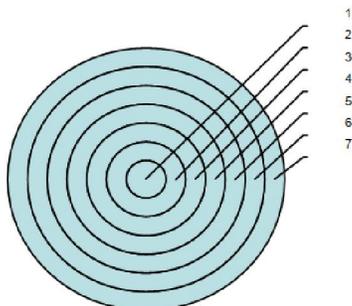
Levels of a formation of self-education of students-biologists: high, average, low.

Criteria and indicators of a formation of self-education of students-biologists: substantial (self-assimilation of biological knowledge, concepts, categories, laws); motivational (interest, requirement, readiness for self-education); activity (mastering by self-education actions, existence of abilities of the rational organization of self-education).

The self-education of students-biologists through the course "Morphology of Plants" focused on development of competence of self-educational activity of students-biologists as professionally important qualities of future teacher of biology, demands the special organization of the pedagogical conditions which component are motivational, substantial and activity conditions. The motivational part of pedagogical conditions assumes stimulation of motivation of self-education; the substantial part of pedagogical conditions consists in orientation of process of self-education to formation of modern biological knowledge, with providing its personnel, methodical, material components; the activity part of pedagogical conditions provides active participation and self-estimation of students-biologists of a level of development of professionally important qualities during introspection of efficiency of the self-educational work.

On the basis of the carried-out analysis of works of Frank, X. Sutman [2, p.89], Marissa Harle, Marcy H. Towns [3, p.369], Karl Steffens [4, p.353], Thomas Eberlein, Jack Kampmeier, Vicky Minderhout, Richard S. Moog, Terry Platt, Pratibha Varma-Nelson and Harold B. White [5, p.262], Harold B. White, Marilee A. Benore, Takita F.

Sumter, Benjamin D. Caldwell and Ellis Bell [6, p.297], Dornan, T., Carroll, C., Parboosingh, J. [11, p.767], Aviv Shachak, Sara Fine [12, p.719] we offer Model of self-education of students-biologists in drawing 1.



Drawing 1. Model of self-education of students-biologists through the course "Morphology of Plants"

Legend to Drawing 1. :

- 1- self-education of students-biologists through the course "Morphology of Plants";
- 2- the purpose - activation of self-education of students-biologists through the course "Morphology of Plants";
- 3- motivational, substantial, activity components self-education of students-biologists through the course "Morphology of Plants";
- 4- competences of self-educational activity of students-biologists (educational, research, organizational, social and educational and technological which are the generalized indicators of activation of self-education of students-biologists);
- 5- levels of a formation of self-education of students-biologists through the course "Morphology of Plants" (high, average, low);
- 6- criteria and indicators of a formation of self-education of students-biologists through the course "Morphology of Plants";
- 7- pedagogical conditions of self-education of students-biologists through the course "Morphology of Plants".

For check of pedagogical efficiency of the Model of self-education of students-biologists developed by us, the structure and the main content of experimental work on activation of self-education of students-biologists in pedagogical conditions through the course "Morphology of Plants" of the self-education of students-biologists organized on the basis of offered Model is developed.

The description of skilled and experimental work at an ascertaining stage includes the analysis of

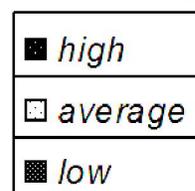
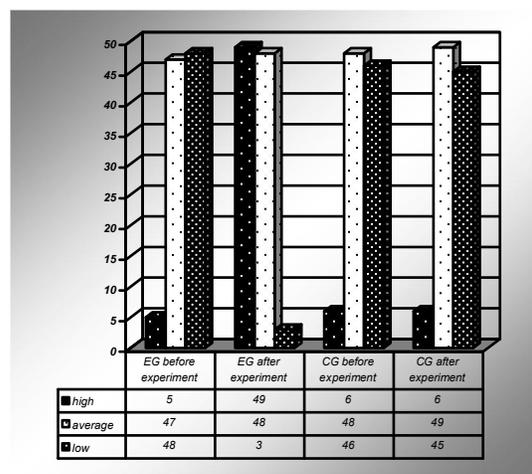
the received empirical data and existing practice of self-education of students-biologists through the course "Morphology of Plants".

87 students biologists of experimental (EG) entered into sample surveyed at an ascertaining stage and control (CG) of groups.

Proceeding from the results of research received at an ascertaining stage, it is possible to argue that, despite available positive experience on the organization of self-education of students, in existing practice of work necessary pedagogical conditions are not realized. During experimental work the following became clear. First, the considerable part of students-biologists is not motivated to self-education. Secondly, educational process of establishment is not directed on the organization of self-education of students-biologists.

Experimental work at a forming stage was constructed by means of realization of all structural components and the put conditions of Model of self-education of students-biologists through the course "Morphology of Plants".

Diagnostics of level of self-education of students-biologists was carried out with use of the rating monitoring system through the course "Morphology of Plants" which allowed to reveal steady increases of level of self-education of students-biologists to what results of experiment in experimental (EG) and control (CG) groups before experiment (drawing.2) testify.



Drawing 2. Diagnostics of level of self-education of students-biologists

The analysis and processing of results of experiment revealed that in experimental groups the number of students-biologists with high level of self-education after experiment through the course "Morphology of Plants" increased by 44 %, number of the students-biologists who have reached middle tier of self-education through the course "Morphology of Plants" – for 1 %, the number of the students-biologists having low level of self-education through the course "Morphology of Plants" – decreased for 48 %.

Results of experiment in control groups testify to increase in number of students-biologists with high level of self-education for 0 %, average self-education level – for 1 %, reduction of low level of self-education – for 1 %.

Thus, the obtained experimental data confirm efficiency of the developed Model of self-education of students-biologists through the course "Morphology of Plants" and the pedagogical conditions of activization of self-education of students-biologists put in Model, such as motivational, substantial and activity conditions. The motivational part of pedagogical conditions stimulated motivations of self-education; the substantial part of pedagogical conditions focused self-education process on formation of modern biological knowledge, with providing its personnel, methodical, material components; the activity part of pedagogical conditions provided active participation and self-estimation of students-biologists of a level of development of professionally important qualities during introspection of efficiency of the self-educational work

Results of research demonstrated that change of character and the organization of self-education of students-biologists of experimental groups at the expense of realization of all structural components of Model of self-education of students-biologists through the course "Morphology of Plants" became considerable distinction between control (CG) and experimental (EG) groups.

Conclusion

As a result of the carried-out research the essence self-education of students-biologists on the basis of the theoretical analysis of a readiness of a problem in the theory and practice is defined. It is proved that self-education of students-biologists is a process and result of development in students-biologists of abilities of statement of a self-educational educational task; realization of self-educational educational actions and operations; self-checking behind a course of the solution of a self-educational educational task and self-image of result.

Pedagogical conditions of activization of self-education of students-biologists of faculty of natural sciences of the state teacher training college are experimentally defined.

The Model of self-education of students-biologists taking into account pedagogical conditions of its activization is developed and approved.

It is experimentally checked and statistical methods proved through the course "Morphology of Plants" pedagogical efficiency of the developed Model of self-education of students-biologists.

Corresponding Author:

Dr. Gabdulhaeva Bakhytzhama Bagustarovna
Pavlodar State Pedagogical Institute, Pavlodar,
Kazakhstan

References

1. Pasechnik, V.V., 2011. Teaching biology: Traditions and Innovations. *Biology in school*, 9: 11–16.
2. Frank, X. Sutman, 2006. Criteria for a special methods course in biological science education for new jersey secondary school science teachers. *Science Education*, 47 (1): 89–97. DOI: 10.1002/sce.3730470118.
3. Marissa Harle, Marcy H. Towns, 2013. Students' understanding of primary and secondary protein structure: Drawing secondary protein structure reveals student understanding better than simple recognition of structures. *Biochemistry and Molecular Biology Education*, 41 (6):369–376.
4. Karl Steffens, 2006. Self-Regulated Learning in Technology-Enhanced Learning Environments: lessons of a European peer review. *European Journal of Education*, 41 (3-4): 353–379.
5. Thomas Eberlein, Jack Kampmeier, Vicky Minderhout, Richard S. Moog, Terry Platt, Pratibha Varma-Nelson and Harold B. White, 2008. Pedagogies of engagement in science. *Biochemistry and Molecular Biology Education*, 36 (4): 262–273.
6. Harold B. White, Marilee A. Benore, Takita F. Sumter, Benjamin D. Caldwell and Ellis Bell, 2013. What skills should students of undergraduate biochemistry and molecular biology programs have upon graduation? *Biochemistry and Molecular Biology Education*, 41 (5): 297–301.
7. Sakenov, D. Zh, etc, 2012. Preparation of students of higher education institution for professional activity in the course of studying of pedagogical disciplines. *World applied sciences journal*, 19 (10): 1431-1436.
8. Tracey Arnold Murray, Pamela Higgins, Vicky Minderhout and Jennifer Loertscher, 2011.

- Sustaining the development and implementation of student-centered teaching nationally: The importance of a community of practice. *Biochemistry and Molecular Biology Education*, 39 (6): 405–411.
9. Michael F. Antolin, Kristin P. Jenkins, Carl T. Bergstrom, Bernard J. Crespi, Subhajyoti De, Angela Hancock, Kathryn A. Hanley, Thomas R. Meagher, Andres Moreno-Estrada, Randolph M. Nesse, Gilbert S. Omenn and Stephen C. Stearns, 2012. Evolution and medicine in undergraduate education: prescription for all biology students. *Evolution*, 66 (6): 1991–2006.
 10. Schantz, E.A, 2012. Professional training of university students as a holistic educational system. *Theory and practice of education in the modern world*, 1: 383-386.
 11. Dornan, T., Carroll, C., Parboosingh, J., 2002. An electronic learning portfolio for reflective continuing professional development. *Medical Education*, 8 (36): 767-769.
 12. Aviv Shachak, Sara Fine, 2008. The Effect of training on biologists acceptance of bioinformatics tools: A field experiment. *Journal of the American Society for Information Science and Technology*, 59 (5): 719–730.

25/03/2014