

Mechanics and Materials, 725-726, 481-486, (2015).
<https://doi.org/10.4028/www.scientific.net/AMM.725-726.481>.

3. K.H. Mo, H.J. Lee, M.Y.J.Liu, T.C. Ling, *Incorporation of expanded vermiculite lightweight aggregate in cement mortar*. *Construction and Building Materials*, 179,302-306 (2018). <https://doi.org/10.1016/j.conbuildmat.2018.05.21g>

4. F.M.N. Silva, E.L. Silva, I.F. Anjos, G. Fontgalland, M.G.F. Rodrigues, *Characterization of Natural Clay Vermiculite, Expanded by Indirect Method for Energy and Microwave*. *Materials Science Forum*, 820, 36-39 (2015).
<https://doi.org/10.4028/www.scientific.net/MSF.820.36>.

5. T.J. Peng, H.J. Sun, H.F. Liu, *Application Mineralogy Characteristics of the Industrial Vermiculite from Different Mines in China*. *Advanced Materials Research*, 178, 53-58 (2011). <https://doi.org/10.4028/www.scientific.net/AMR.178.53>.

6. Y.C. Liu, J.H. Huang, C.H. Huang, M.H. Tsai, Y.C. Chuang, *Effect of Vermiculite and Bulk Density in the PU Foam Composite Board for the Absorption Coefficient and Acoustic Impedance*. *Advanced Materials Research*, 910, 82-85 (2014).
<https://doi.org/10.4028/www.scientific.net/AMR.910.82>

7. X. Zhang, W. Jin, Y. Lv, H. Zhang, W. Zhou, F. Ding, *Preparation and characterization of mortar mixes containing organic acid/expanded vermiculite composite PCM*. *Functional materials*, 24 (3), 481-489 (2017).
<http://dx.doi.org/10.15407/fm24.03.481>.

8. Y. Deng, J. Li, H. Nian, *Expanded Vermiculite: A Promising Natural Encapsulation Material of LiNO₃, NaNO₃, and KNO₃ Phase Change Materials for Medium-Temperature Thermal Energy Storage*. *Advanced Engineering Materials [Internet]*. Wiley; 2018 Apr 23;800135. Available from:
<http://dx.doi.org/10.1002/adem.201800135>.

9. A. O. Atynian, K. S. Bukhanova, L. V. Trykoz, S. M. Kamchatnaya, O. M. Pustovoitovu, *Pretreatment impact on vermiculite burn temperature*. *Collection of scientific works of the Ukrainian State University of Railway Transport*, 183, 106-114 (2019).
<https://doi.org/10.18664/1994-7852.183.2019.169875>.

Current advanced technologies in training of a family physician

In the process of reforming the system of medical care and opening of general practice/family medicine institutions, being the basis of the health care system, a general practitioner / family physician with high qualification, deep knowledge in general, pre-clinical and clinical disciplines is at the core of health care [7]. Considering the global tendencies, the improvement of the quality of educational sendees, provision of equal access to quality education at all levels, rise of the competitiveness of the national education system and its integration into common European educational space are marked among the priority directions of the development of education in Ukraine. Moreover, the system of higher medical education requires new approaches to the training of qualified medical professionals and comprehension of the pedagogical process in HEI [10]. Current international standards in the field of education provide for the training of qualified specialists capable of integrating theoretical knowledge and practical skills into a holistic system, acquiring the advanced technologies, etc. The search for standards in higher medical education is an optimal strategy for achieving a conceptually new level of quality of training of future professionals, based on the training of healthcare professionals in compliance with the conventional international standards of teaching, taking into account the peculiarities and interests of the national healthcare system [2,7,9].

The need for transition from traditional to advanced technologies is because the existing education system is not focused on activating the personality traits of the students, and the educational process is essentially monologue. That is why the use of active teaching methods such as trainings, discussions, games, simulation technologies, etc., should not be a practical appendix to theoretical issues, but rather serve as the starting point from which both a teacher and students are involved into learning process, which is a synergic activity for solving certain problems, including those aimed at the personal development of learners. Consequently, the position of a teacher also changes: from the supervisor to a participant in the synergic activity [12].

The choice of using different teaching approaches in medical education is influenced by the features of the medical specialty itself, which, obviously, is clearly expressed by both theoretical and practical components. Among the most frequent objections to the feasibility of using different teaching technologies in medical education, the thesis that the patient's bed is the only place to assess a physician's knowledge, skills and abilities is the most commonly used. However, it is not always, and not every example that can be considered directly during hands-on patient care. In particular, this may be due to the lack of appropriate patients while studying a particular topic, but at

the same time, there are active technologies and teaching methods ensuring effective training of specialists [5,11,15].

Noteworthy, integration of learning, involving the use of distant forms at the stage of theoretical training and working out practical skills at the clinical bases of internship, is crucial. Distant forms of education cannot exist independently and are used in combination with classical forms of learning.

Stage-oriented training encompasses maximum use of e-learning forms at the first stage (theoretical training) and distant practical activity directly with the patient at the next stage. Hands-on patient care is carried out at the affiliated clinical bases and educational and practical centers of the Department.

At the Department of Family Medicine and Therapy, the following distance learning technologies have been used:

- distant on-line lectures for the general target audience. Lectures have been given in the form of multimedia presentation. The main purpose of the distant lecture was to raise the audience's interest and encourage physicians to find information on the given subject;
- distant on-line workshops, aimed at interactive communication between the teacher and physicians, undergoing training, affiliated to the primary health care center. Teacher's role: guiding (organizational), advisory (informational) and controlling. During the distant workshop the Internet and the means of video communication were used;
- distant individual on-line consultations were aimed at interactive communication of a teacher with a specific trainee to familiarize physicians with updated information and control by the teacher. During individual consultation, the teacher assessed the level of theoretical knowledge of the physician and his/her clinical competence, which made it possible to make changes in the individual plan of the trainee, to refine some topics.

The findings of the study have shown that the learning process is transformed from the teacher's monologue and the study of a set of teaching materials into a persistent dialogue between a teacher and a trainee, transferred from the classroom to the conditions, more comfortable for the physician in terms of time and place of the implementation of the process of knowledge acquisition.

Admittedly, classical technological are supplemented with novel, in particular, interactive learning technologies. The term "interactivity" comes from English word "interact" where "inter" means a mutual and "act" means to act. Thus, interactivity is the ability to be engaged in the mutual dialogue [5,15]-

Interactive learning foresees that all participants of the learning process interact with each other, share information, jointly solve problems, simulate

situations, evaluate the actions of colleagues and their own behavior, immerse themselves in the real atmosphere of business cooperation to solve a number of problems related to their interests, needs and requests. At the same time there is a constant change in the types of educational activities [6,15].

According to the European Academy of Teachers in Family Medicine/General Practice (EURACT) recommendations, the model of blended (hybrid) learning is the most effective in the training of family physicians. Blended learning involves a combination of independent work of a physician with or without the use of electronic platforms, media services and traditional activity in the classroom utilizing interactive methods of group work.

Currently, simulation technologies are widely used during the training of health care professionals, which is a novel trend in the training of highly qualified medical personnel [14].

The range of techniques, combined in the concept of "simulation technology", is diverse, including multiple simulators, where practical skills are mastered with a high level of realism, and computer and virtual models for improving the algorithms for activities with different clinical situations [13].

Body Interact is the innovative simulation tool designed for use at higher medical schools and medical colleges to solve problems and clinical rationale with virtual patients. "Virtual Patient" is the innovative interactive learning technology that allows the healthcare learners to be fully immersed in the diagnostic and therapeutic process with the help of the computer model of a real clinical situation, to take independent decisions on the diagnostic and treatment tactics, to see and understand the consequences of their decisions, not thereby violating the patient's rights and safety. The unconditional advantages of this technology are also the stimulation of interest in independent study of the material, visualization, the ability to "take a break" in the process of working with the patient and obtain the necessary background information.

Currently, interns and professional physicians, specializing in general practice/ family medicine, internal diseases, emergency medicine, neurology, pediatrics, endocrinology undergo training at the Department of Family Medicine and Therapy, provided by the faculty members. 20 clinical scenarios with different nosology are available to study. Such innovations in training of specialists significantly improve both the theoretical knowledge and acquisition of practical skills, and, generally, contribute to enhancement of the quality of training. The environment is as in real life: consolidation of all the resources and data into a dynamic physiological model with dozens of built-in states and health disorders, laboratory tests, diagnostic visualizations, assessment scale, intervention and treatment, along with highly effective tools for summing up. The database of the scenarios available for learning is constantly updated, providing teachers with a large library of pre-defined

clinical scenarios with updated clinical protocols. Body Interact offers an intuitive clear tool for creating personalized scenarios, thereby enabling physicians to enhance their expertise. In order to improve the quality of learning for each individual learner or the whole group, a detailed analysis is presented on the visual information panel, including a metric of actions and an intuitive clear interface, which greatly facilitates the setting and launch of the objectively structured clinical tests.

The system of professional medical education should quickly respond to continuous changes in science and research, increasing requirements for the individual and professional qualities of a specialist and timely make the necessary changes in the organization of the educational process. The peculiarity of practical classes in clinical disciplines is the classical approach: the lesson should be built around a real patient, accelerating students to think clinically, evaluate the resulting data and individually prescribe treatment. The quality of education depends on the quality of the acquired adequate knowledge, which meets professional requirements. From this point of view, a timely correction of the structure of the lesson is crucial [1,8].

Reorganization of the educational process at the university requires improvement of the methodology of conducting a practical clinical lesson with the provision of qualitative methodological and visual aids of learning, organization of the independent clinical work of a learner, reducing the number of learners per one teacher, especially in the study of clinical disciplines. The use of simulation technologies as one of the methods of reorganization of the educational process aids in optimization the acquisition of practical skills and increases the interest of family physicians in the profession [4].

Practicing of clinical skills utilizing dummies, simulators and standard patients under the supervision of a teacher provides an opportunity for interns and professional physicians to make erroneous decisions in a safe environment that improves their clinical competencies. In simulation training the priority is given to precisely the execution of educational assignment, in the process of which a negative outcome of medical care is allowed, so that the learner will feel the full extent of his/her responsibility, but, at the same time, not received a possible psychological trauma, if this happens with a real patient. Simulation training eliminates fear and psycho-traumatic component from the negative outcome of the first internship experience, which greatly improves learning of the material.

At the same time, it is evident that simulation training is not a panacea in any way, and cannot completely replace the hands-on patient care training, since both technologies should organically complement each other in the contemporary educational process.

Simulation training technology implements more effective practical training of physicians in the specialty "General practice/family medicine", by 2-3 times improving the effectiveness of study.

Undoubtedly, the positive effect of utilizing interactive methods of teaching has been proven long ago. The following advanced technologies and interactive teaching methods have been introduced by the faculty members of the Department of Family Medicine and Therapy during the training of family physicians: brainstorming, discussion, case study, presentation, role play [6,15].

Brainstorming is one of the techniques widely used during the trainings.

Brainstorming is strictly staged and the sequence of stages cannot be changed. The teacher clearly formulates the task, the solution to which the learners need to find. The learners can suggest any thought that came in their mind. It is important to keep to one of the main rules of brainstorming - NO comments during the collection of ideas, even if they look ridiculous, inappropriate, since any comment may stop the process of producing ideas.

Discussion is a collective discussion of an important issue in order to find ways to solve it. The purpose of a discussion as a teaching method is to obtain reasoned points of view or positions on a given subject or problem.

A discussion contributes to the development of critical thinking, allows to determine own position, develops skills to keep to own standpoint, and extends knowledge on the problem.

A discussion may be arranged in the form of round table, debates.

Case study is a special interactive technique, which involves modeling of life situations, their consideration, solving under the pre-defined scenario, public defense of the decision.

Simulation of practical situations can be done in two ways:

1. Based on the description of real-life events (the patient's medical history, publications).
2. Based on simulated situations (situational tasks, test tasks).

Presentation is a mode of presenting information, using a variety of technical means. An educational presentation is intended to assist a teacher in providing a convenient and visual presentation of theoretical and practical material.

Role play is a managed game aimed at the achievement of a pre-defined game outcome. Game situations simulate or reproduce real-life or typical working situations in which several people play certain roles in a specific scenario for a pre-selected study topic. A role-play allows creating a safe environment in which learners can consider, as well as identify alternative ways of dealing with the situation.

An integrated approach to the organization of the educational process is crucial in the formation of a harmoniously developed personality of a physician-citizen of Ukraine, trained at a higher medical school. The need for improvement and optimization of the educational process is dictated by the current requirements for training of highly qualified, all-round developed, erudite medical specialists [3].

Undoubtedly, the main objective of the activity of an educator at a higher medical educational institution is the training of competent, expert physicians, and, therefore, they should clearly understand the meaning of the terms "expertise" and "competence" and the conditions of training that must be created for physicians to achieve their appropriate professional competence.

In professional training of a specialist a competency-based approach is of key importance, since it is concerned with integrative characteristic of a personality that reflects the willingness and ability to mobilize the acquired knowledge, skills, abilities, experience, methods of activity and professionally significant and personal qualities of a specialist.

The main objective of the postgraduate education is to focus on the practical training of specialists. The assessment of practical training has been carried out according to the teacher's evaluation scale in the following categories: *Clinical aspect*: to determine the degree of emergency care in a particular situation; to conduct a clinical examination and formulaic its results; to prescribe additional examinations and laboratory tests and use their results; to make diagnostic and therapeutic hypotheses; to perform simple technical manipulations, required in a certain clinical situation; *Communication*: to provide information in a clear form; to interact with a patient and his/her family properly; to keep to the rules of conduct when working in a team; to demonstrate the ability of synthesis and scientific curiosity; *Oral presentation*: to be able to describe, present the course of the examination, clinical case, findings of scientific research, etc.

Apparently, the professional activity of a family physician is patient-oriented, considering his/her demands, needs and personality, as well as beliefs, fears, expectations and diseases. Therefore, the final decision is the result of communication with the patient; personal aspects requires action and, consequently, appropriate training of future physicians; the corresponding physician-patient relationship involves activities of a physician during treatment and epidemiological studies; the physician should use several different sources of information, such as the International Classification of Primary Care (ICPC-2) and numerous general practitioner's manuals [5].

Some professional competence of a physician is formed based on comprehensive knowledge (declarative and procedural), skills (behavioral, operational and cognitive), personal qualities, clinical experience and external circumstances.

The National College of Teaching General Practitioners (CNGE) defines competence as a complex capability associated with the context of learning or practical training, which encompasses several types of skills and abilities and allows, by analyzing a similar kind of circumstance, not only to identify problems, but also effectively solve them in accordance with a certain situation [5].

To carry out the profession of a general practitioner, competencies and five areas of activity are required:

- Specific clinical approach;
- Communication with patients and their environment;
- Application of professional equipment and instruments;
- Coordinated interaction with professional environment and sanitary and social services;
- Ability to promote the development and enhancement of the prestige of general practice specialty.

The need to simulate the process of forming the research competence of future physicians in the course of studying disciplines is determined by the need for vocational education in the construction of this process, identification of its basic components, monitoring the outcomes, obtaining information on the possibilities for its improvement. Obviously, a model is an artificially created object that transmits any essential features of an original, displaying its structure and correlations between its components in the simplest form. In the scientific literature, the semantic field of the concept of a "model" is defined as a device that reproduces, simulates the structure, functions, actions of any other device (when tested); the image, analogue, scheme of a certain fragment of reality, object of culture or cognition of the original; interpretation (in the logic, mathematics).

The analysis of pedagogical literature gives evidence that the modeling process is widely used in pedagogy and didactics. In this case both the content of education and educational activities are subject to modeling. In pedagogy, the model is considered as a system of objects or signs, which reproduces certain essential properties of the original system, it is a generalized reflection of the object, the result of abstract practical experience, rather than the direct result of the experiment.

The problem of modeling the pedagogical process was reflected in the publications of domestic scientists O. Antonova, O. Berezyuk, S. Vitvitska, O. Rudnitska, S. Goncharenko and others. We consider the pedagogical model as the system, which reflects a real object of research capable of replacing it in the process of study. A model for forming the research competence of future physicians in the process of studying disciplines, which is defined as structural-content, has been developed to reflect the unified picture of the investigated process. While developing a pedagogical model, it was concluded that the problem of the formation the research competence of future physicians in the process of studying disciplines is complex and versatile, which should be considered from the standpoints of several interrelated scientific approaches, namely: systemic and competent-based ones [5]. The resulting data show that the simulation of the process of formation of research competence in accordance with the concepts of systemic and competent-based approaches ensures a positive dynamics of the degrees of the formation of research competence of family physicians.

Conclusions

Thus, the motivation of physicians to continuous self-improvement, active participation in the educational process, comprehensive complex theoretical and practical training lays the foundations for clinical thinking and promotes acquisition of general clinical competencies. Modeling of the pedagogical process of the proposed study in accordance with the concept of systematic approach guarantees the development of research competence in family physicians.

To achieve maximum acquisition of the learning material, to make the lesson interesting and dynamic, easy for comprehension, various interactive teaching methods, discussed above, namely, brainstorming, working in mini-groups, discussion, case-method, role-play and presentation should be used.

Introduction of simulation technologies into the learning process directs a physician towards the team work, the ability to consider the point of view of another specialist, promotes the development of communicative skills, the formation of intellectual autonomy and professionalism. The use of such interactive technologies as "Virtual Patient" in the professional training of the family physicians enables solving problem situations by means of effective actions, intuition, training, stimulation of self-learning, full disclosure of the potential and enhancement of personality motivation, the formation of behavior skills in critical situations, ability to enrich activity with the new ways of implementation, development of professional flexibility and mobility, making of the final decision, enjoy the activity itself, and not their outcomes [3].

At the current stage of the development of health care and medical education, the use of various distance learning technologies is very up-to-date and in demand, providing an opportunity to achieve a qualitatively new level of the postgraduate education.

References

1. Bulavenko O.V., Konkova D.H., Kukuza I.L. (2014). *Dosvid zastosuvannya symulatsiinykh tekhnolohii u navchalnomu protsesi spetsializovanoho akushersko-hinekologichnoho klastera na bazi Vinnytskoho natsionalnoho medychnoho universytetu im. M.I. Pyrohova [The experience of applying simulation technologies in the educational process of a specialized obstetric and gynecological cluster at M.I. Pirogov Vinnitsa National Medical University]. Shliakhy udoskonalennia navchalnoho protsesu i neobkhidnist vprovadzhenia novykh pidkhodiv u roboti kafedr medychnoho universytetu v suchasnykh umovakh - Abstract for the educational-methodological conference "Ways of improvement of educational process and the necessity of introducing new approaches in the activity of the Departments of medical university in modern conditions", (pp. 18-19). Vinnytsia [in Ukrainian].*
2. Voronenko Yu.V., Mintser O.P. (2013). *Rozvytok novykh tekhnolohii u pislidyplomnii osviti likariv iprovizoriv: tendentsii, ekspertni vysnovky ta realni*

otsinky efektyvnosti navchannia [Development of new technologies in the postgraduate education of physicians and pharmacists: trends, expert conclusions and real assessments of educational effectiveness.]. Medychna osvita - Medical Education, 2,19-23 [in Ukrainian].

3. Hevkaliuk N.O. (2018). *Kompetentnisnyi pidkhid u profesiinii pidhotovtsi likariv-stomatolohiv dytiachykh [Competency-based approach in the professional training of children's dentists]. Medychna osvita - Medical Education, 1(77), 16-18 [in Ukrainian].*
4. Husiev V.M., Astakhov V.M., Shevchenko Ye.M. (2018). *Shliakhy optymizatsii dodyplonmoho navchannia na kafedri akusherstva i hinekolohii [Ways of optimization of undergraduate training at the Department of Obstetrics and Gynecology]. Medychna osvita - Medical Education, 1(77), 19-21 [in Ukrainian].*
5. Zhdan V.M., Babunina M.Yu., Kitura Ye.M., Shylkina L.M., Tkachenko M.V. (2018). *Zastosuvannya innovatsiinykh tekhnolohii na kursakh pidvyshchennia kvalifikatsii likariv [Application of the state-of-the-art technologies during the advanced training of physicians]. Visnyk problem biolohii i medytsyny - Bulletin of Biology and Medicine, vyp. 4,1.1(146), 142-145 [in Ukrainian].*
6. Zhdan V.M., Kitura Ye.M., Babanina M.Yu. (2018). *Osnovni interaktyvni metody navchannia v pidhotovtsi likaria-spetsialista [The basic interactive approaches in the training of a professional physician]. Aktualni pytannia kontroliu yakosti osvity u vyshchykh navchalnykh zakladakh - Topical issues of quality control of education at higher educational institutions: Materials of the scientific and practical conference with international participation, (pp. 88-89). Poltava [in Ukrainian].*
7. Linchevskiy O.V., Chernenko V.M., Piatnytskyi Yu.S. (2017). *Shliakhy reformuvannya systemy vyshchoi medychnoi osvity v Ukraini v suchasnykh umovakh [The ways of reforming the system of higher medical education in Ukraine in modern conditions]. Medychna osvita - Medical Education, 3, 6-9 [in Ukrainian].*
8. Lisovyi V.M., Kapustnyk V.A., Markovskiy V.D., Zavorodnii LV. (2016). *Zahalni problemy ta perspektyvy zastosuvannya symulatsiinykh metodiv osvity [General problems and perspectives of using simulation methods of teaching]. Symulatsiine navchannia v systemi pidhotovky medychnykh kadrov - Simulation training in the system of training of medical personnel: Materials L of the educational and methodological conference devoted to the 212th anniversary of the foundation of the KhNMU. (pp. 3-7). Kharkiv [in Ukrainian].*
9. Pylypchuk V.I. (2018). *Rol innovatsiinykh tekhnolohii u navchanni z tsykladu "khirurhiia" studentiv 6-ho kursu medychnoho fakultetu [The role of advanced technologies in study of Surgery course by 6-year-students of the Medical Faculty]. Medychna osvita - Medical Education, 1(77), 43-45 [in Ukrainian].*
10. Podkovko Kh.V. (2016). *Innovatsiini osvitni tekhnolohii u vyshchykh medychnykh (farmatsevtichnykh) navchalnykh zakladakh: pereshkody ta perspektyvy vprovadzhenia [Advanced teaching technologies at higher medical (pharmaceutical) educational institutions: obstacles and prospects of implementation]. Visnyk. Seriya «Pedagogichni nauky» - Herald. Series «Pedagogical Sciences», 140, 61-64 [in Ukrainian].*
11. Potiazhenko M.M., Sokoliuk N.L., Kitura O.Ye., [et. al.] (2017). *Innovatsiini tekhnolohii v orhanizatsii roboty likariv-interniv iz fakhu «Vnutrishni khvoroby» [Advanced technologies in the organization of self-study of interns majoring in Internal diseases]. Innovatsiini tekhnolohii v orhanizatsii samostiinoi roboty studentiv medychnykh osvitnikh zakladiv - Advanced*

technologies in the organization of self-study of students at medical educational institutions: Materials of educational and scientific conference with international participation, (pp.126-127), Poltava [in Ukrainian].

12. Skrobach N.V., Shapoval O.A., Petryna V.O., [et. ai] (2018). *Shliakhy pidvyshchennia yakisnoho rivnia znan [Ways to improve the quality of knowledge]. Medychna osvita - Medical Education*, 1(77), 50-54 [in Ukrainian].

13. Tutchenko M.I., Susak Ya.M. (2013). *Symuliatsiini tekhnolohii v navchanni studentiv-medykiv praktychnym navychkam [Simulation technologies in teaching medical students practical skills]. Visnyk Ukrainskoi medychnoi stomatolohichnoi akademii «Aktualni problemy suchasnoi medytsyny» - Bulletin of the Ukrainian Medical Stomatological Academy «Actual problems of modern medicine»*, t.13, vyp. 1(41), 326-327 [in Ukrainian].

14. McLeod R. *Science, medicine, and the future / Rory McLeod, Robert Stone // BMJ. - 2001. - V. 323.*

15. Zhdan V.M., Kitura Ye.M., Babanina M.Yu., Tkachenko M.V., Volchenko H.V., Shylkina L.M., et. al. (2018). *Implementation of main interactive teaching methods in training of medical specialist. Medychna osvita - Medical Education*, 1(77), 68-71 [in Ukrainian]

Successive processes in secondary phytocenoses in the mountain forests of Adjara

Human intervention in nature everywhere has activated natural processes. The mountains of Adjara are no exception. Adjara represents a mountainous, extremely small grounded region and is characterized with very complicated engineering geological conditions. The intensive pace of land development violates the fragile balance and causes the active development of natural-geological processes. On these kinds of territories, the natural renewal of ecosystems is a long-term and complicated process.

Due to the unpredictable and unforeseen consumption of the local natural resources, the woodlands of Adjara Mountains, in particular, Tkhillvana, Jabashvilebi, Ghorjomi, Danisparauli, Tsablana, Jabnidzeebi, Tsinareti, Akho, Vashlovani, Rakvta, Pushrukauli and others are destroyed as a result of landslide processes, which made the soil barren. On April 29, 1989 the landslide in the valley of River Skhalta belongs to the number of grandiose and deep landslides. There are different factors of developing the landslide, including trees cut down and building a road in the mountain [5]. The natural processes are supposedly caused by the collapse of over cropped layers and erosive processes. For the formation, growth and development of the certain species of vegetation or the communities represented by them, the crucial importance is given to the environmental factors. In the mountainous conditions the relief is of an important factor for forming forest ecosystems [1]. As a result of natural processes, the information on the natural renewal of the damaged (destroyed) ecosystems is very poor. Therefore, the issue of studying the peculiarities of the dynamics of successive processes of forest ecosystems renewed on the landslide slopes of the mountainous regions in Adjara is quite topical. The goal of the research is to study the peculiarities of successive processes in the renewal forest ecosystems on the landslides, in particular, to study the successive changes of the serial stages of the composition of species in the process of coenotic structure, natural renewal and forest regeneration

The object of research is in Khulo region, Adjara. Renewed forest ecosystems on the slopes of the mountain in Tsablana.

The key method of the research was the method of traditional reconnaissance - survey expedition. We managed to collect the samples of herbarium, to describe typical phytocenosis by means of special questionnaires and to treat them. For geo-botanical descriptions we will apply traditional methods of phytocoenological research [2, 3, 4, 6].

We should mention here that despite the fact that the landslide totally destroyed the vegetative cover on the slope (mixed forests are developed on the right side slope) and the lifeless substrate was consisted of road metals, during a short period (30 years) a pine-tree forest was developed without any human intervention on the abovementioned habitat. It can be seen on the thin, undeveloped soils as grouped together. Since a pine tree is rapidly

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INNOVATIONS IN SCIENCE: THE CHALLENGES OF OUR TIME

Collective monograph

Volume 2

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