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USE OF STREAMING TECHNOLOGIES IN THE DEVELOPMENT OF STUDENTS' NATURAL SCIENCE COMPETENCES

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Abstract: The article scientifically substantiates the importance of streaming technologies in the process of developing students' natural science competencies, which can be conditionally divided into structural parts consisting of cognitive components.

It also reflects the scientific and theoretical foundations for the development of natural science competencies in working with streaming technologies, where it is possible to record, store, edit and retransmit information from the Internet.

Key concepts: stream, streaming technologies, education, development, teaching methods, competencies, natural science literacy.

Relevance. An analysis of foreign pedagogical experience in the use of streaming technologies in education in the context of the study showed that foreign researchers studied the use of media in the educational process in the data stream on the Internet and their influence on the theory and practice of teaching. In particular, their research shows how to use existing educational content and approaches to creating independent media in the formation of students' science literacy. The deepening of international cooperation in the field of education and science around the world and the intensive development of digital technologies further increase the need for the use of innovative technologies in the educational process to improve the knowledge, skills and abilities of students, which puts the problem under study in the category of very topical issues of the time.

Scientific institutions of the world community conduct scientific research focused on the development of professional competencies of future specialists by means of information and communication technologies related to their innovative activities. In the world's leading educational institutions (USA, Singapore, South Korea, China), the scale of research on the development of professional competencies of future specialists with the help of information and communication technologies is growing. At the same time, there is a demand for the use of various didactic forms of teaching new content to develop the professional competence of future specialists, teachers of the new generation, the use of innovative educational tools, and the expansion of motivational and cognitive interests of students. This requires the improvement of technologies aimed at acquiring academic knowledge in the educational process.

Much attention is paid to “ensuring a high level and quality of personnel training with a deep knowledge of modern information and communication technologies; organization of research work in higher educational institutions, increasing their efficiency; wide application of research results; “Ensuring strong integration of education, science and industry; involvement and comprehensive support of the creativity of talented youth in research” [1]. There is also a need to conduct scientific research in the field of natural sciences, a system for developing natural science competencies of students, strengthening reproductive and receptive skills in teaching biology using streaming technologies.

“This is a great opportunity to nurture and develop rare talents, and at the same time, give the opportunity to manifest their potential at the world level”[15].

As you know, natural science literacy is the ability of a person to apply the scientific ideas of the natural sciences, his achievements and the ability to take an active citizenship in decision-making on the development of the natural sciences.

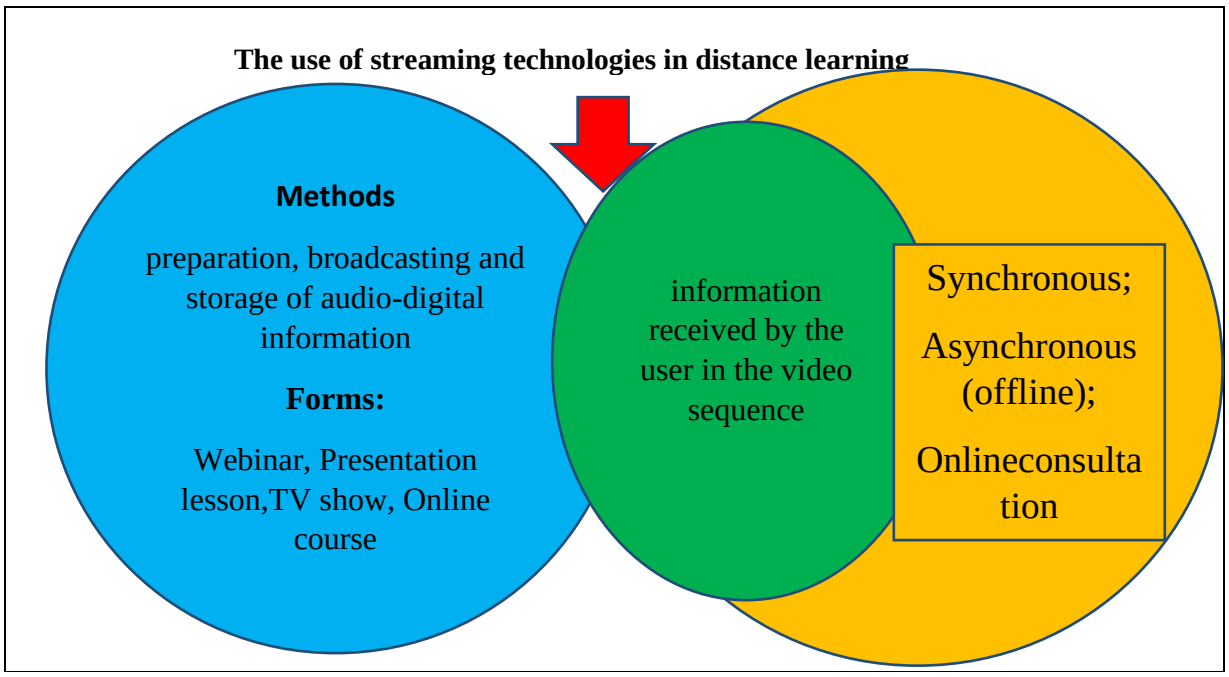
Natural science literacy includes knowledge of the individual about nature, technology, methods for obtaining scientific knowledge, understanding the validity of these procedures and their use, i.e., methodological knowledge. It is based on existing scientific knowledge, as well as the ability to predict changes in science, life situations.

"In the real educational process of the university, professional training includes the study of four cycles of disciplines: social and humanitarian, natural sciences, general professional and special disciplines. Each of them has its own specifics, plays its role in the formation of the general competence of future specialists" [12].
Therefore, science competence is the ability to use "knowledge gained to identify problems in real situations that can be investigated and solved using scientific methods, to draw conclusions based on observations and experiments"[17]

In recent years, opportunities have been created in Uzbekistan to provide a wide range of work on training and advanced training in popular specialties, the formation of natural science competencies in the context of the professional training of future specialists, the active involvement of young people in scientific and pedagogical activities in the field of natural and exact sciences, culture, entrepreneurship, sports and other areas[7].
One of the main problems in higher education is the lack of software for "universal authored teaching methods using modern mobile devices, interactive equipment, podcasting, screencasting, streaming and advanced real technologies, as well as web services, mobile applications and alternatives using digital technologies"[8]. In this regard, there is a need to improve diagnostic technologies that reveal the level of development of natural science competencies among students, the scientific substantiation of the pedagogical and psychological aspects of innovative technologies for the competence-based approach to teaching the natural sciences.

The degree of knowledge of the problem. The scientists of the republic - M. Aminov, M. Aripova, M. Takhirova [4,9,10]. the issues of continuous introduction of innovations in the management of the education system were studied; the issues of organizing the educational process based on information and communication tools and the implementation of problem-based learning in them were studied by A. Abdukadyrov, M. Lutfillaev, F. F. Abdullaev, G. Norimova [5,6,7,8,9,10,11,20 ,21]. However, scientific research on the development of natural science competencies that contribute to the future professional growth of students in the process of teaching natural and exact disciplines based on streaming technologies has been little studied.
In the CIS countries, research work on the technological problems of developing the professional competence of IT specialists was carried out by S.S. Arbuzov, P.I. Pidkasistym, I.T. Kachan, N.F. Koryakovtseva, S.S. Kuklina, O.G. Polyanov, B.E. Starichenko, M.F. Stronin [17,18,19,23,24,28,29].
In foreign countries, research work on the development of professional competence of future teachers was carried out by scientists A. Wenden, B.G. Angelopoulos, D.M. Garyfallidou, G.S. Ioannidis, H. Bijnens, M. Bijnens, M. Vanbuel, D.L. Fried-Booth, R. Gairns, J. Nisbet.
The purpose of this article is to scientifically substantiate the essence of the use of streaming technologies in the development of natural science competencies among students.
Tasks and methods for solving the problem: to improve scientific and methodological recommendations for the development of natural science competencies based on streaming technologies that increase the efficiency of the pedagogical process; to scientifically substantiate the model for the development of natural science competencies based on streaming technologies.

Stream ("stream" - "stream") - information received by the user in a video sequence or audio sequence. The term is also used by internet users as a concept for live streaming on video hosting.
Streaming (stream) - a set of methods for preparing, broadcasting and storing audio-digital information from the screen of a personal digital device and a webcam using modern telecommunication services on the Internet for distance learning (Fig. 1.).



Rice. 1. The use of streaming technologies in distance learning

"The educational activity of students based on streaming technologies contributes to the acquisition of knowledge, skills, abilities, natural science competencies and is a set of scientific, technological, organizational measures aimed at training highly qualified personnel"[3]. Accordingly, the teacher must ensure the targeted inclusion of the identified innovative streaming ideas in the educational process.

The development of natural science competencies of students based on these technologies is reflected in the following: the use of teaching technologies and teaching aids based on various information and communication, textbooks, developments, recording, analysis, creation of innovative pedagogical technologies, etc.

Competences in working with streaming technologies –the ability to record, store, edit and retransmit information from the Internet.

Based on streaming technologies, the process of developing students' natural science competencies can be divided into structural parts (or components), which consist of a cognitive stage.

Students' perception of educational material should be mastered on the basis of streaming technologies; its understanding, the formation of concepts is evaluated by the following factors:

firstly, tens and even hundreds of thousands of viewers can watch the broadcast;

secondly, streaming technologies have more functionality and require less time to set up compared to webinar technologies;

thirdly, the use of streaming technologies does not require the use of expensive professional equipment and software.

Methodsandresults.During the study (2020-2022), the following forms, methods and means of streaming technologies were identified that contribute to the intensification of the development of natural science competencies among students in classroom and extracurricular activities (see Table 1).

Table 1.

sofstreamingtechnology	**ods**	**ties**	**s**

lecture	edialogue, interview,	speed Internet connection; phone and webcam; f professional equipment: and video cards, phones, cameras, audio and	ing the rhythm of l learning; increase exibility of planning educational process ncourage students to independently; ding the practice of independent edge management or students
ronous	storming, interactive		
hronous (offline)	ctive		
econsultation	l, practical		
ecourse	edialogue, interactive		
nar	edialogue	landvideocards	
ntationlesson	ctive	phones, cameras,	
ow	l, practical	phone, webcam	

As can be seen from the table, the organization of classes in higher educational institutions using streaming technologies is much more efficient than traditional education.“Learning based on streaming technologies helps to achieve the set goals and objectives - expanding learning opportunities, ensuring the rhythm of learning, engaging students in disciplinary learning, reducing classroom stress, increasing the flexibility of learning process planning and encouraging students to self-educate” [ ].In the course of the study, criteria were developed for determining the development of students' natural science competencies based on streaming technologies (see Table 2).

Table 2

Criteria for determining the development of students' natural science competencies based on streaming technologies

CRITERIA	PERFORMANCE
ption of visually constructed natural science educational ial; be able to identify the main and essential primary ideas; ding, sorting, analysis, interpretation, modeling of data nitted from the Internet, based on ICT.	mentation of a long-term plan for nteed training.
opment of skills of analysis, synthesis, analogy, forecast of tional material	dingthequalificationcategory

opment of natural science competencies of students	ency of mastering knowledge, skills,
opment of motivation by discipline	
opment of didactic competencies	y to organize future professional ies
y to use acquired knowledge in future activities	dingthequalificationcategory

As shown in the table, visual, audio and kinesthetically constructed learning materials based on streaming technologies are designed to develop students' learning activities in the classroom.The experiment was conducted in 2019-2020, 2021-2022 academic years at the Tashkent State Pedagogical University named after Nizami, Navoi State Pedagogical Institute, and Samarkand State University, where 583 students and 74 professors-teachers were involved. A total of 657 respondents took part in the experiment (See Table 4).

Table 3.

Experimental sites and the number of respondents involved in the experiment

	Experimental sites	**umberofstudents**	**berofteachingstaff**	nts **ingstaff** (%)
	kent State Pedagogical University named after Nizami	196	26	114% - 21%
	avoiStatePedagogicalInstitute	193	22	112% -17%
	SamarkandStateUniversity	193	22	113%-17%
	Total	582	72	

In experimental and experimental work within the framework of the study: the following research methods were used: theoretical and logical analysis, comparison, questioning; interviews, test samples, generalization, observation of advanced innovative pedagogical practices; questionnaire, mathematical and statistical methods.The ways of using streaming technologies in Biology classes are considered, where the teacher chooses a training video, watches it with the whole group of students; uses video materials to discuss with the audience. The possibility of using the video after class to watch the learning material or, for students who missed it for any reason, was considered as an opportunity to use the video as a stand-alone study material.The following scenarios for using streaming technologies to develop subject competencies in Biology were developed: 1) the teacher recorded the solution of a specific problem on the computer screen (for example, encouraging graphical representation to further optimize the text used.); 2) after showing the video to the students, set the necessary settings on their personal computers, memorized the sequence of actions; 3) students record videos about working with any web service (during preparation and recording, remembering the sequence of actions), after which they can use the experience of classmates to study the web service on their own. Each of the participants in the experiment solves the problem by designing. In addition to the above, the level of development of students' subject and information competencies, as well as their technical capabilities, were taken into account.As a result of experimental studies, technical means were used to practically apply streaming technologies: computers, projectors, interactive whiteboards, LD and LCD TVs, clickers. Some of these functions are used by specialized educational platforms (for example, "HTML Academy", "Uniweb", "Netology", "Universarium"). Using these learning platforms, personal experience in teaching allows us to draw the following conclusions: the study of complex educational materials is not only exciting, but also effective, and the process of acquiring new knowledge is fast.In March, April and May 2021, team videoconferences were organized to develop students' subject competencies in biology based on streaming technologies. This video conference laid the foundation for the interaction of students living in different regions of the country and the implementation of educational tasks in a team (Fig. 2).

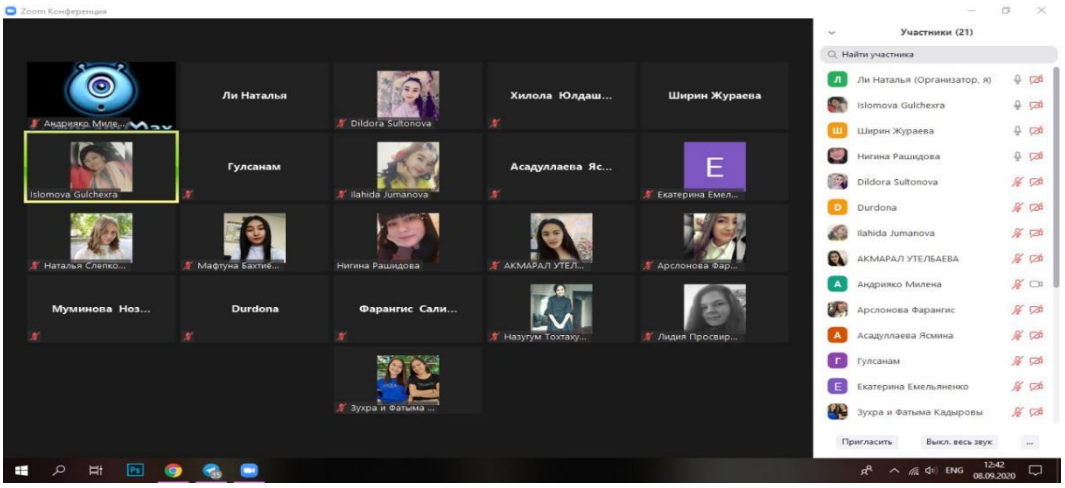


Figure 2. Screenshots of videoconferencing aimed at developing students' knowledge, skills and abilities in the discipline based on streaming technologies

From the comments below on the video used in the experiment, it is clear that such activities are mutually beneficial for both parties involved in creating new content using streaming technologies. In our opinion, the use of streaming learning technology is promising not only for distance learning, but also for the implementation of the offline learning model.To develop natural science competencies among students, we analyzed broadcasts with students on the Internet, the use of streaming technologies - distance learning using IT tools, preparation, broadcasting and storage of demonstrations (broadcasts) of educational topics in classrooms and outside the classroom.The training sessions were held in the following stages: planning of educational activities, this stage was organized and conducted by the teacher; informing students about the goals and objectives of the online course, the timing and technologies of future educational activities; preparation of broadcast at synchronous online consultations; organization of asynchronous learning (offline mode).

At this stage, the teacher and students were able to view fragments from previous broadcasts. A wide range of opportunities in practical training such as recording various images, video and audio, developing skills in using resources (webcams, work screens), spreadsheets, computer games (games), programs, graphics, images, presentations, etc.) , the ability to use multiple scenes, their location and the ability to mark transitions between them. For example, 193 students and 22 teachers who participated in pilot sessions at Samarkand State University gained exposure to online courses and streaming technologies. Of these, 81% acquired the skills of presenting events, reporting methods and completing tasks in a timely manner based on streaming technologies, and 98% of teachers acquired the skills to conduct lectures, seminars, master classes, online consultations. 99.1% of teachers and students have mastered the skills of conducting them and 100% participation in all planned broadcasts.

On the basis of streaming technologies, a model was developed that fully reflects the process, using the criteria developed for the development of natural science competencies of students (Fig. 3). In these sessions, 100% of faculty and students demonstrated the ability to view clips from previous broadcasts.

The possibilities of increasing the interest of students in the study of natural science knowledge based on streaming technologies (87%), determining the level of knowledge, skills and abilities in the disciplines that make up the subject (93%), questionnaires, tests, written work (100%) and enriching the content of education were shown. in the teaching of natural disciplines through a comprehensive analysis of the results (100%).

During the experiment, the following options for using streaming technologies in the educational process were considered: a) Watching videos with an audience, where the video provides clear information for discussing the problem collectively. The video also contains instructions for a specific task that students complete in practice. Experienced and creative educators use a variety of activities (for example, general discussions, group work, etc.). In order to develop students' educational skills in the discipline, group video conferences provide an opportunity to talk with several training participants at the same time. This requires an Internet connection using a special program (Skype, Team Talk, Conferendo, TrueConf, etc.) Also, during the videoconference, students had the opportunity to work with document files. To determine the effectiveness of group video sessions during the experiment, we conducted a survey among students. Of the 582 participants in the experiment, streaming

technologies have the following advantages: wide access to distance learning (100%), convenience for students with disabilities (99%), wide access to education (67%); the ability to send files in a few fractions of a second (73%); save on trips to various excursions (for example, the Museum of Natural History of Uzbekistan) and, accordingly, increase labor productivity (77%); convenient and safe communication (100%); knowledge acquisition management (97%); connecting parents or the administration of an educational institution to a session during a video conference, monitoring the behavior of students and teachers (99%); attraction to lectures of highly qualified specialists of various fields of knowledge (100%); save videoconferencing recordings for later viewing and analysis by the teacher (100%), etc.

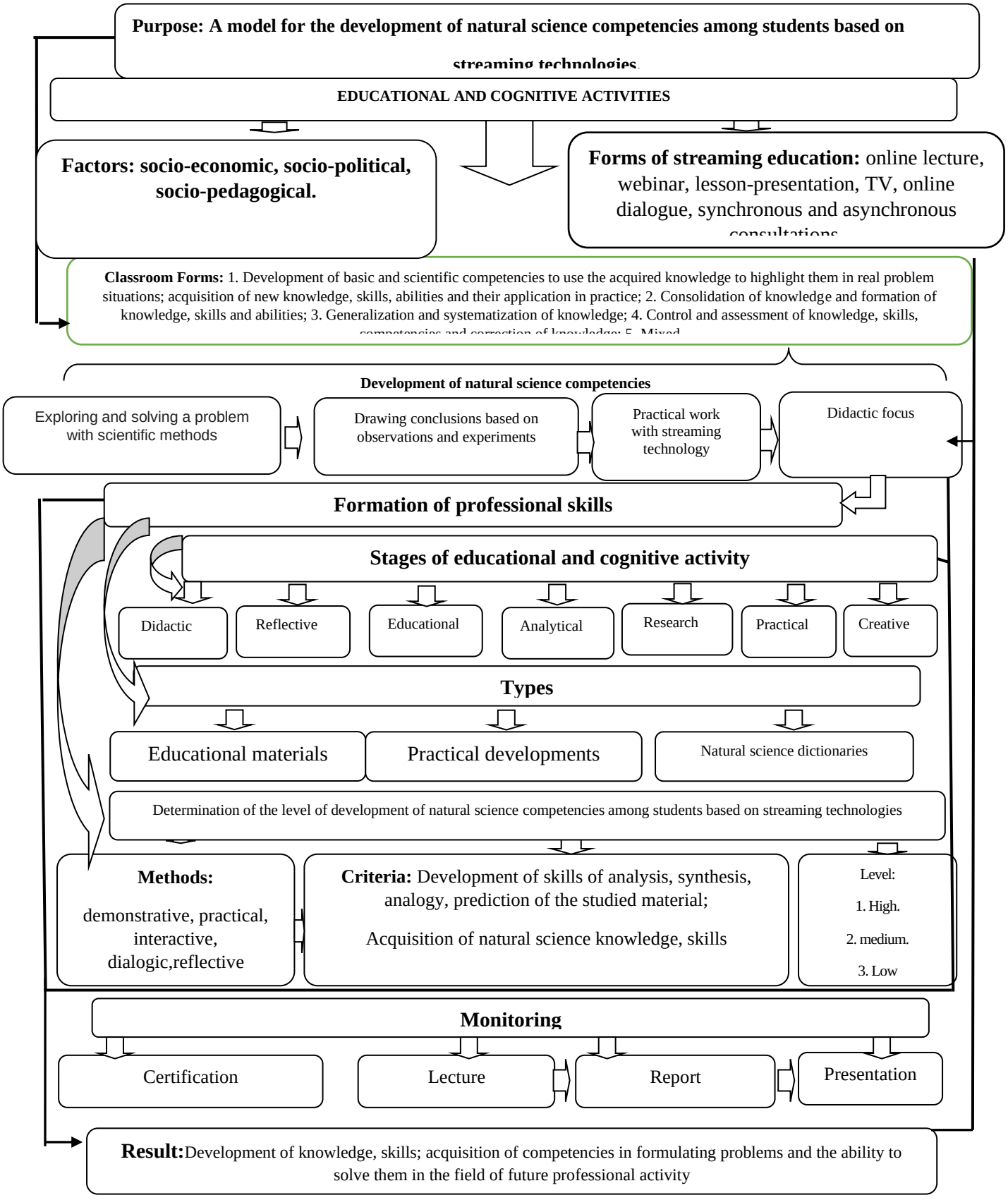


Figure 3. The model for the development of natural science competencies among students based on стриминг технологий

The model shown in Figure 3 is designed to develop students' natural science competencies based on streaming technologies, was put into practice in the 2021-2022 academic year, and its level of effectiveness was analyzed. Achieved mastery of knowledge, skills and experience by students (98.9%), assistance in the development of competencies (98%), creation of opportunities for the manifestation of their unique characteristics (89%); implementation of joint activities of students, the formation of the necessary personal qualities (78%); natural science knowledge and skills (98%) and the moral and emotional development of each student (83%).

To organize videoconferencing during experimental training, it was required: high-speed connection; reliable and stable power supply; buildings that optimally absorb noise; choosing the right light background; availability of authorized personnel; timely equipment upgrades. The quality of video communication was evaluated based on the equipment chosen by the interlocutors and the speed of the connected Internet.

As part of the study, the author's methodology "Development of natural science competencies in students based on streaming technologies" was developed. The introduction of this method into pedagogical practice was carried out in several stages: stages of personal-value, constructive, reflective analysis.

Conclusions. The methodology for developing natural science competencies among students based on streaming technologies in the experimental groups for 2020-2021 was to develop the competencies necessary for their future professional, scientific and everyday activities. For example, in the 2021-2022 academic year, in the course of an experimental study conducted among 196 students at the Tashkent State Pedagogical University and Samarkand State University at the Faculty of Natural Science, based on the above methodology, students formed: logistical, didactic, pragmatic, professional competencies; formation of skills for the effective use of scientific terms; development of skills in compiling, editing and analyzing text in the specialty.

Interactive methods were also used in the experimental sessions. These are “SWOT-analysis”, “FSMU”, “Case”, “Blitz-survey” and others.

Hypothesis H1 and hypothesis H0 were selected, showing the effectiveness of pre-experimental and post-experimental development of respondents with streaming technologies in the experimental and control groups (Table 4).

Table 4 (a).
Indicators of the development of natural science competencies among students based on streaming technologies (beginning of the experiment)

Groups	ber of students	Assimilation rate			
		Exc.	Good	atisfactorily	nsatisfactory
imental group	**291**	61	97	112	20
ol group	**291**	31	43	175	43
	582				

Table 4 (b).
Indicators of the development of natural science competencies among students based on streaming technologies (end of the experiment)

Groups	ber of students	Assimilation rate			
		Exc.	Good	atisfactorily	nsatisfactory
imental group	**291**	109	110	72	-
ol group	**291**	70	131	80	10
	582				

The following statistically grouped variation was obtained by determining the learning rates in the experimental group and the number of students in Xini and similar control groups Yjnj, respectively, as well as the number of teachers at the end of the experiment and the number of teachers in Xini and Yjnj. We also have excellent marks - 5 points, "good" - 4 points, "satisfactory" - 3 points and "unsatisfactory" - 2 points, as well as a high mark of teachers - 4 points, average mark, average mark - 3 points, and the lower indicator is 2 points.
The schema corresponding to these choices is as follows (see Figure 4.5):

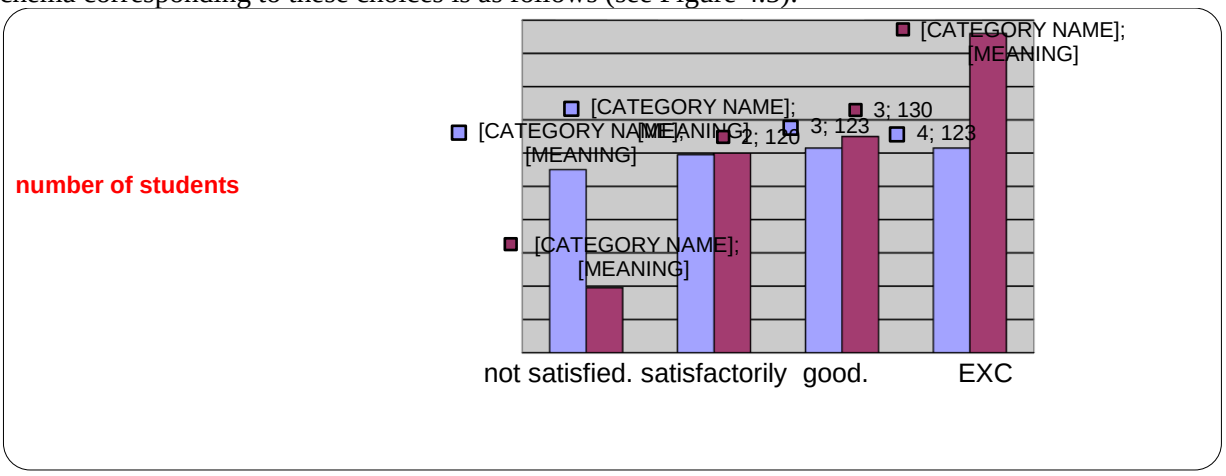


Figure 4. Indicators of the formation of competencies among students in the control and experimental groups.

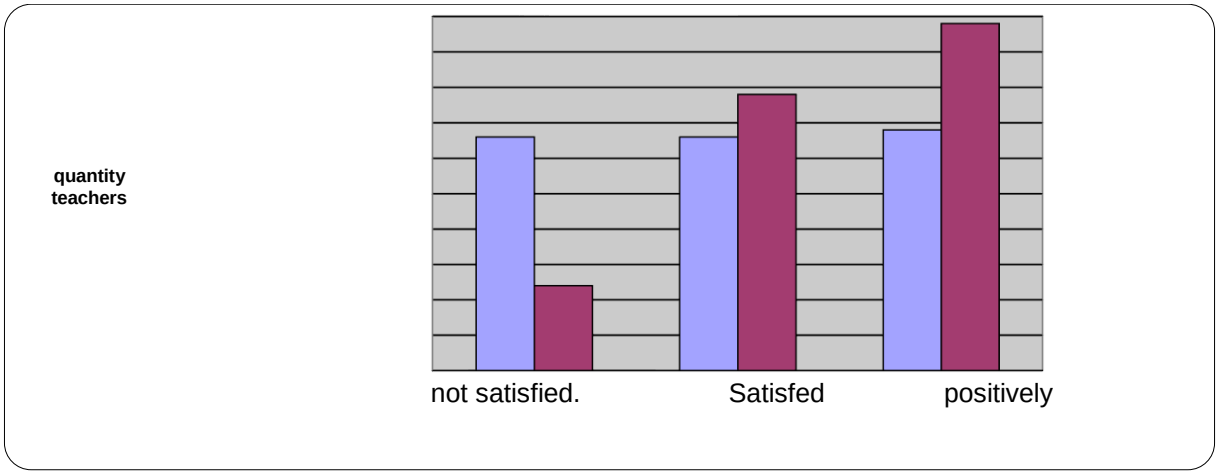


Figure 5. Streaming Technology Adoption Rates teachers in the control and experimental groups.

At the final stage, the formation of natural science competencies among the students of the experimental groups was 1.14 times higher.
The confidence interval at the initial stage was found based on the above statistical formulas, the confidence interval at the final stage was equal, and they did not intersect.
For students:

$$\overline{X} = \sum_{i=1}^{n=4} P_i X_i = 0{,}47 \cdot 4 + 0{,}23 \cdot 3 + 0{,}22 \cdot 2 + 0{,}08 \cdot 1 = 1{,}88 + 0{,}69 + 0{,}44 + 0{,}08 = 3{,}09$$

$$\overline{X}\,\% = \frac{3{,}09}{4} \cdot 100\% = 77{,}25\%$$

$$\overline{Y} = \sum_{i=1}^{n=4} q_j Y_j = 0{,}26 \cdot 4 + 0{,}26 \cdot 3 + 0{,}25 \cdot 2 + 0{,}23 \cdot 1 = 1{,}04 + 0{,}78 + 0{,}5 + 0{,}23 = 2{,}55$$

$$\overline{Y}\% = \frac{2{,}55}{4} \cdot 100\% = 63{,}75\%$$

According to the results of this calculation, the effectiveness of the study was confirmed by statistical methods by an average of 11%, and the results of the study were recognized as effective.

Research work on the development of natural science competencies in students using streaming technologies and their results fully confirm the hypotheses and allow us to draw the following conclusions:

1. The use of streaming technologies creates an opportunity for deep learning and a solid assimilation of knowledge, skills and abilities by students, expanding the horizons of mastering the knowledge of the future profession.

2. The expansion of the scale of the Internet in the context of digital technologies requires students to have knowledge that focuses on acquiring professional experience before starting their professional activities. Considering the prospects for using streaming technologies, we consider it important to consider it in the context of the following components in terms of its application in the educational process and use as a new information technology: streaming technology can be considered as media, geoinformation technology, distance learning technology, video conferencing technology, case technology.

3. In order to constantly update the knowledge, skills and abilities of students, to fully master the skills of motivation, implementation and reflection, it has been established that the development of natural science competencies based on streaming technologies plays an important socio-pedagogical role.

4. The developed model for the development of natural science competencies among students based on streaming technologies was put into practice in the 2020-2021 and 2021-2022 academic years and showed its effectiveness. It was revealed that the need to use streaming technologies in the development of students' competencies in the classroom is extremely important.

Thus, the development of natural science competencies in students through the use of streaming technologies creates favorable conditions for conducting educational forms of education in electronic format: online lectures, webinars, presentation classes, TV shows, online dialogue lessons, synchronous asynchronous consultations. It also contributes to the effective organization of the technological process of natural science competencies of students based on streaming technologies (demonstration, practical, interactive, dialogue, reflective).

REFERENCES

1. Decree of the President of the Republic of UzbekistanSh.M. MirziyoyevNo. PP-4391 “On measures to introduce new management principles into the systemofhigher and secondary specialized education” dated July 11, 2019. Electronic resource: http: www.lex.uz.

2. Abdullaeva, Sh. A. (2019). Lifelonglearning: continuingeducationforsustainabledevelopment. Life long learning: continuing education for sustainabled evelopment (pp. 4-10).

3. Abdullaeva, Sh. A., &Zainitdinova, M. A. (2018). Improving the quality of education in the system of retraining and advanced training of teaching staff. scientificresult. PedagogyandEducationalPsychology, 4(3).

4. AbdullaevaSh.A., Takhirova M.A. (2019) Improving the mechanisms for designing educational goals. Tilvaadabiyottalimi, 12 (41-43).

5. AbdullaevaSh.A., LutfillaevM.Kh. Issues of development and implementation of software for pedagogical diagnostics (on the example of higher educationali nstitutions of the Republic of Uzbekistan). ElectronicJournal: Educational Resources and Technologies, 2019, no. 3 (28) / https://www.muiv.ru/vestnik/pdf/pp / pp_2019_3_28_14_20. (dateofaccess: 07/29/2020).

6. AbdullaevaSh.A., Aripova M.G. (2021) Simulationmodel of collaborative projects in Russian literature. Teacher of the XXI century/https://cyberleninka.ru/a

7. AbdullaevaSh.A., Norimova G. Streaming technology asosidatalabalardafanga oid competencelarnirivojlantirish. Monograph.-Guliston, 2021.-120 b.

8. Abdullaev F.A. Integrationofdigitaleducationalresourcesintoeducation: pedagogical conditions for modeling an electronic service // Youngscientist. - 2019. - No. 5. - P. 152–154. - URL: https://moluch.ru/archive/243/56102/ (dateofaccess: 07/29/2020).

9. Aminov M. Innovationtalim technology larivapedagogycompetent / tmetod.uz/wp-content/uploads/innovation-talim.
10. Aripova M.G., AbdullaevaSh.A. Electronictutoringin a collaborative projectas the basis for transforming students' knowledge of Russian literature// Modern problems of science and education.-2020.-№6.;URL:http://www. science-education.ru/ru/article/view
11. Abdukadirov A.A. Theory and practice of intensification of training of teachers of physical and mathematical disciplines // - T., "Fan", 1991.
12. Belousova N.A. (2010) Formation of natural science competencies in the context of improving the quality of professional training. Educational Institution " Military Academy of the Republic of Belarus", Minsk, Republic of Belarus 1 (4) ISSN 2029-1922
13. Bespalko V.P. Thecomponentsofpedagogicaltechnology. - Moscow: Pedagogy, 3rd ed., 2004 . 218p.
14. Davydov, V. P., Obraztsov, P. I., &Uman, A. I. (1998). Methodologyandmethodsofconducting a psychological and pedagogical experiment. Moscow: Logos.
15. Dynich, V. I. (2009). Maintenance of qualityof higher education in republic Belarus: organizational, methodological and content aspects. Švietimas: politika, vadyba, kokybė, 1(2), 34–41.
16. Zeer, E. F. (2007). Renewalofbasicvocationaleducationbasedon a competency-basedapproach. VocationalEducation, 4, 9–10.
17. Zimnyaya, I.A., Bodenko, B.N., Krivchenko, T.A., &Morozova, N.A. (1999).
18. Kuklina S.S. Collectivelearningactivityin a group at the stage of improving foreign language communication skills.// Foreign languages at school-2018, No. 1 -p.58.
19. Koryakovtseva N.F. Modernorganizationofindependentworkofstudentsof a foreignlanguage: A guide for teachers. M., 2002. 176 p.;
20. LutfullaevM.Kh. Computersimulationmodelsintheeducationalprocess. Monograph - T .: FAN, 2013. - 102 p.
21. Lutfillaev, M. Kh., &Abdullaeva, Sh. A. (2019).// Issues of development and implementation of pedagogical diagnostics software (on the example ofhighereducational institutions of the Republic of Uzbekistan). Educational resources and technologies, (3 (28)).
22. Makarov, A. V., Perfil'ev, Yu.S., &Fedin, V.T. (2009). New Generation Higher Education Standards: A ComparativeAnalysis. Minsk: RIVSH. Zhuk, O. L. (2006).
23. Mizherikov, V. A. (2004). Dictionary-referencebookonpedagogy. Moscow: TC Sphere. With. 398
24. Pidkasy P.I. Independent cognitive activity of school children in teaching: Theoretical and experimental research. -M.: Pedagogy, 2017.- 240 p.
25. Polyanov O.G. Theoreticalandpracticalaspectsofthedevelopmentofprofile-oriented programs in the English language.// Foreign languages at school 2019 - No. 3 - p.8.
26. Ruzmetova, S. T., &Abdullaeva, Sh. A. (2021). Theuseofdigitaltechnologiesineducation.// Problems of modern science and education, (3 (160)), 33-35.
27. Raven, D. (2002). Competence in modern society . Identification, development and implementation. Moscow: Kogito-Center.
28. Starichenko B. E., Arbuzov S. S. The use of screen casting in teaching IT disciplines. Informatika i obrazovanie. - 2017. - No. 2 (281). - S. 19-22.
29. Stronin M.F. Educational games inE nglish - M.: Strength, 2019.-84s.
30. Fedin, V.T. (2008). Diagnosing the competenciesofuniversity graduates: a teachingaid. Minsk: R