



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1439326>Available online at: <http://www.iajps.com>

Research Article

**MONITORING OF SCHOOLCHILDREN ACADEMIC
ACTIVITIES AT LESSONS OF BIOLOGY WITH REGARD TO
MODERN FORMS AND METHODS OF DIAGNOSTICS**Rina S. Kamahina¹, Ehlmira Sh. Shamsuvaleeva², Nuriya R. Galimova¹¹Kazan Federal University,²Volga Region State Academy of Physical Culture, Sport and Tourism, Kazan

rina150973@mail.ru

Abstract:

Diagnosis of knowledge and skills of students is an important link in the learning process, from the correct formulation of which the success of learning largely depends. Diagnosis is the so-called "feedback" between the teacher and the student, the stage of the learning process, when the teacher receives information about the effectiveness of teaching the subject.

In connection with the emergence of GEF second generation, the requirements for subject biological education have undergone some changes. First of all, the new educational standard was developed depending on the tasks that the student and the graduate will face directly in adulthood, therefore, the main result of education is the mastery of universal educational activities (UAL), which allow to set and solve vital life and professional tasks. At the heart of the UAL is the subject's ability to self-development and self-improvement through the conscious and active appropriation of a new social experience.

Modern methods of diagnosing students, compiled in accordance with the requirements of the federal state educational standard (GEF), are more effective than traditional ones, that is, they have a higher indicator of academic achievement and educational motivation among students.

Keywords: *federal state educational standard (FSES), system-activity approach, universal educational activities (UAL), diagnostics, testing, rating estimation, portfolio, competence-oriented tasks, motivation, state educational standard.*

Corresponding author:**Ehlmira Sh. Shamsuvaleeva,**

Volga Region State Academy of Physical Culture,

Sport and Tourism, Kazan

rina150973@mail.ru

QR code



Please cite this article in press Ehlmira Sh. Shamsuvaleeva et al., *Monitoring of Schoolchildren Academic Activities at Lessons of Biology With Regard To Modern Forms and Methods of Diagnostics.*, Indo Am. J. P. Sci, 2018; 05(09).

INTRODUCTION:

The fundamental changes that happened in the economy of the Russian Federation imply the implementation of the reforms in the domestic educational system. That is why currently, Russian schools undergo the modernization of the educational system, which is associated with the introduction of FSES of the second generation. From this it follows that the priorities of education, upbringing and methodological work at schools are to undergo certain changes.

The basis of the mentioned standard is the system-activity approach, which fundamentally changes the ways of interaction between a teacher and a pupil. Currently, a teacher's task is not to give as much knowledge to a pupil as possible, but rather to unlock one's potential, skills, and talents, to develop one's individual characteristics. That is why currently UAL are of a great importance because they allow pupils to effectively put their knowledge to use [8].

For a teacher to estimate the mastering of UAL by the pupil, one may need to perform a pedagogical diagnostics of the quality of education material's digestion by the pupils. However, traditional methods of knowledge diagnostics are not sufficient for reflecting the relevant level of the pupils' UAL formation.

Methods:

In the course of working on this article, theoretical and empirical methods were applied, such as learning and analysis of domestic and foreign academic and methodological literature, educational experience, as well as the methods of observation, testing, surveying, pedagogical experiment, poll, discussion, study of school documents and products of pupils' activities.

Discussion:

Diagnostics is an integral part of any learning process, with the help of which a teacher monitors pupils' academic progress. The implementation of a new educational standard brings revolutionary changes to the educational system because it implies fundamental changes in both teacher's role and the priorities in pupils' schooling. In this regard, traditional diagnostic methods appear to be insufficient for meeting educational aims and are to be changed pursuant to the requirements of FSES of the second generation [9,6].

The diagnostics that is aimed at improving the educational process should target the following goals:

- 1) Internal and external correction in case of

inaccurate assessment of educational outcomes;

- 2) Defining the gaps in pupils' knowledge and confirmation of positive educational outcomes;

- 3) Planning further stages of the educational process;

- 4) Motivation by means of providing incentives for academic achievements and regulation of further steps' complexity;

- 5) Improving the educational environment [2].

A critical distinction of FSES from SES lies in the fact that from now on, a primary aim is represented by personal result rather than a subject-specific one. The pride of place goes to the child's personality rather than just a set of a must-know information.

The assessment system should be focused on inspiring pupils to perform objective control, to form the need in adequate self-esteem rather than concealing one's lack of knowledge and skills. In order to monitor the process of achieving educational aims, the means of accumulative assessment of academic progress should be created, which would allow tracing and evaluating the dynamics of achieving goals [10,11].

Thus, a need arises to introduce an accumulative system of evaluation of academic process that would include monitoring, ratings, and creating portfolios.

The objects of such monitoring are represented by the educational process and its results, by personal characteristics of all the participants of the educational process, their needs and attitudes towards the educational institution [5].

Practice shows that in the course of pedagogical monitoring of the character of mutual relations between the subjects of educational activity at school, the method of questionnaire-based survey proves to be the most relevant [12, 13].

In order to gain pedagogical information from the monitoring, the latter should be conducted based on the system of the following principles: the diagnostic-prognostic one; the principle of personal practicability; the principle of pedagogical communicativeness; the principles of informational integrity, socially regulated conditionality, scientificity, continuity, integrity, and consistency [3].

The rating assessment is based on an accumulative grading system that allows building a pupil's rating, which represents an individual numeric indicator of integral estimation of academic achievements,

formed by means of adding rating points that were obtained in the result of particular educational activities' assessment, which should ideally take into account the coefficient of significance of these actions in the achievement of educational aims [14].

The end goal of the rating technology is a pupil's formation in the capacity of the subject of educational and scientific activity; it implies such a level of development of pupils, when they are able to set a goal for their activity, to plan and correct their actions and compare their results to the goals set [1].

The results of pupils' individual achievements that are not subject to the final assessment include the learners' value orientations and individual personal characteristics. Generalized assessment of these personal results of mastering of various educational programs by the pupils should be performed in the course of various monitoring researches.

An assessment as a means of ensuring the quality of education implies the involvement of both pedagogues and pupils into the assessment activities. The formation of such skills as self-analysis, reflection, self-control, self-assessment and peer assessment allows pupils to effectively manage their educational activity, favor the development of self-consciousness, the ability to openly express and defend their opinion, to take responsibility for the results of their own solutions [4].

Thus, the traditional assessment system, which is mainly based on controlling and testing of knowledge and skills, transforms to the system that is aimed to manage educational process and ensure the quality of the latter thanks to the standards of the second generation. An example of such an assessment of educational institutions is portfolio.

The pupils' portfolio is the systematic evaluation of meeting the requirements to the results of education by the latter (personal, metasubject, subject ones), who mastered the basic educational program of basic general education.

In modern conditions of requirements set for education, it is important to implant the practical skills in pupils, thus forming the all-objective competencies. For this aim, it is good to use competence-based tasks (CBT), which are the form of control that embodies both innovational and traditional forms of work that are implemented through the prism of a modern educational standard [15].

The results:

The experimental base for the conduction of the monitoring of pupils' academic progress was represented by three educational organizations, namely, Municipal autonomous general educational institution (MAGEI) "Gymnasium No. 139", MAGEI "Secondary school No. 39 with enhanced education in English", Municipal budgetary general education institution (MBGEI) "Secondary school No. 171 with enhanced education in particular subjects" during the period of education in 2016-2017 academic years. For the conduction of the monitoring in each of the educational organizations mentioned above, three classes were selected, in which different methods were applied. In one of them, the traditional means of assessment were applied, in the second one, competence-based tasks were used, while in the third one, the test assignments were used in accordance to FSES recommendations.

The academic records of pupils, obtained in MAGEI "Gymnasium No. 139" of Kazan city, the Volga region, are presented in Figure 1.

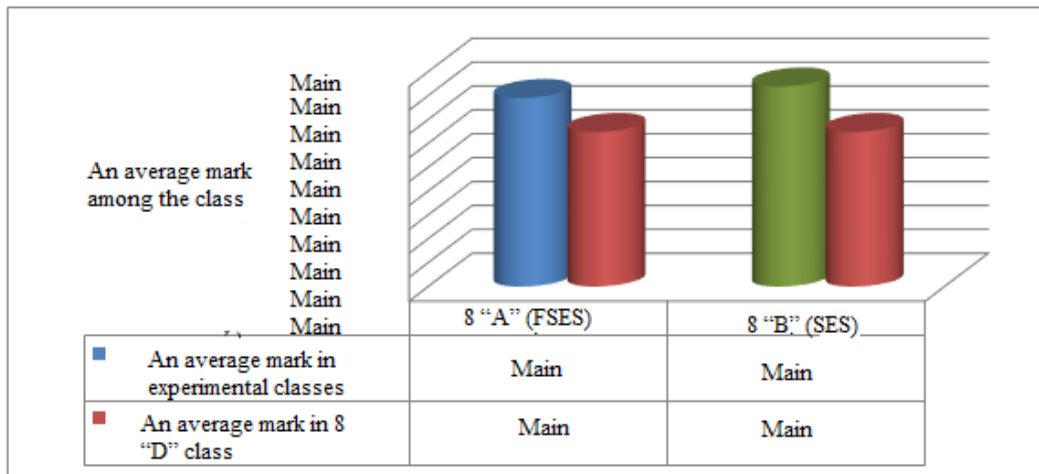
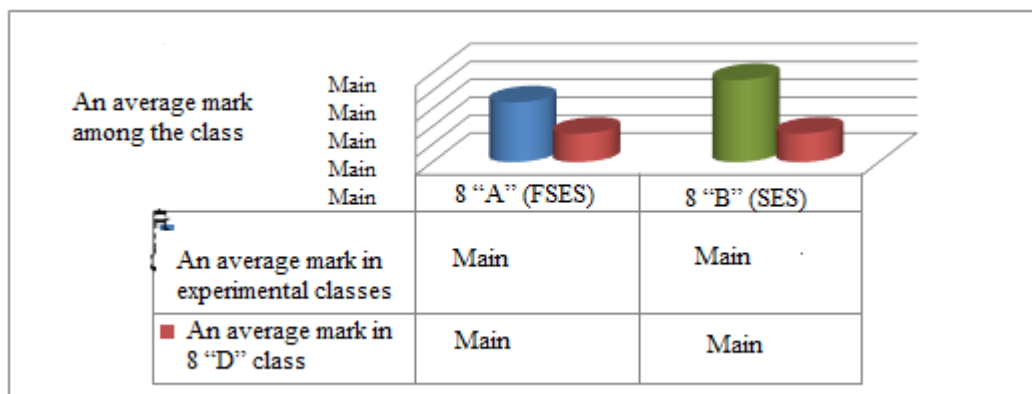


Figure 1. The results of the monitoring of the academic progress of the pupils in MAGEI "Gymnasium No. 139"

According to the obtained data, in the control class, where the diagnostics were performed by the traditional means, the performance level was lower than it was in the classes where the pupils' performance was assessed with the FSES-based and CBT-based tests.

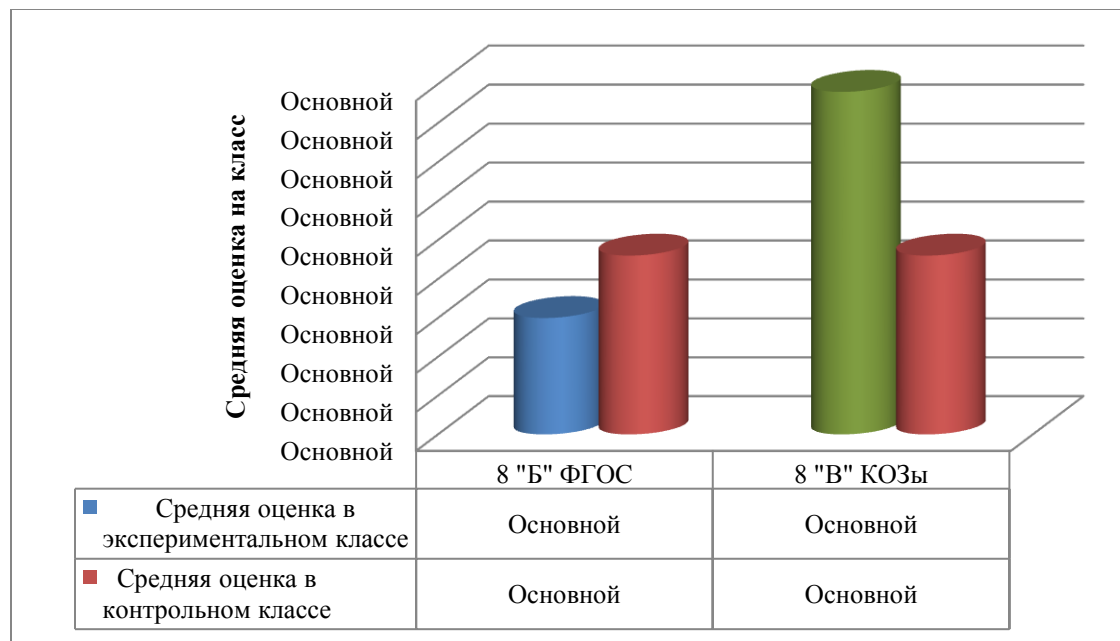
The results of the monitoring of the pupils' academic progress in MAGEI "Secondary school No. 39" are presented in Figure 2.



№39» Figure 2. The results of the monitoring of the pupils' academic progress in MAGEI "Secondary school No. 39"

The obtained data showed us that in the control class, where the diagnostics were performed by the traditional means, the performance level was lower than it was in the classes where the pupils' performance was assessed with the FSES-based and CBT-based tests.

The results of the diagnostics of the academic progress of the pupils in Municipal budgetary general education institution "Secondary school No. 171" are presented in Figure 3.



Средняя оценка на класс	An average mark among the class
Основной	Main
Средняя оценка в экспериментальных классах	An average mark in experimental classes
Средняя оценка в 8 «Д» классе	An average mark in 8 “D” class
8 «А» (ФГОС)	8 “A” (FSES)
8 «Б» (КОЗЫ)	8 “B” (SES)

Figure 3. The results of the diagnostics of the pupils’ academic progress in MBGEI “Secondary school No. 171”

Within this context, there is no critical difference between the methods used for diagnosing pupils’ academic progress. Most probably, it is associated by the fact that the academic progress of the pupils in question is approximately the same, and that’s why they performed equally well in both tests and competence-based tasks adapted to FSES requirements and traditional testing (Fig. 3).

In order to exclude the possibility of getting a statistical difference in the results caused by different

levels of pupils’ proficiency across the various classes, we conducted two types of diagnostics of pupils’ academic progress. In one class, the first test was conducted as a traditional one, and the second one was conducted in accordance with FSES requirements, and that was a competence-based task. The experiment was held in 8 “A” form (in MBGEI “Secondary school No. 171”) (Fig. 4).

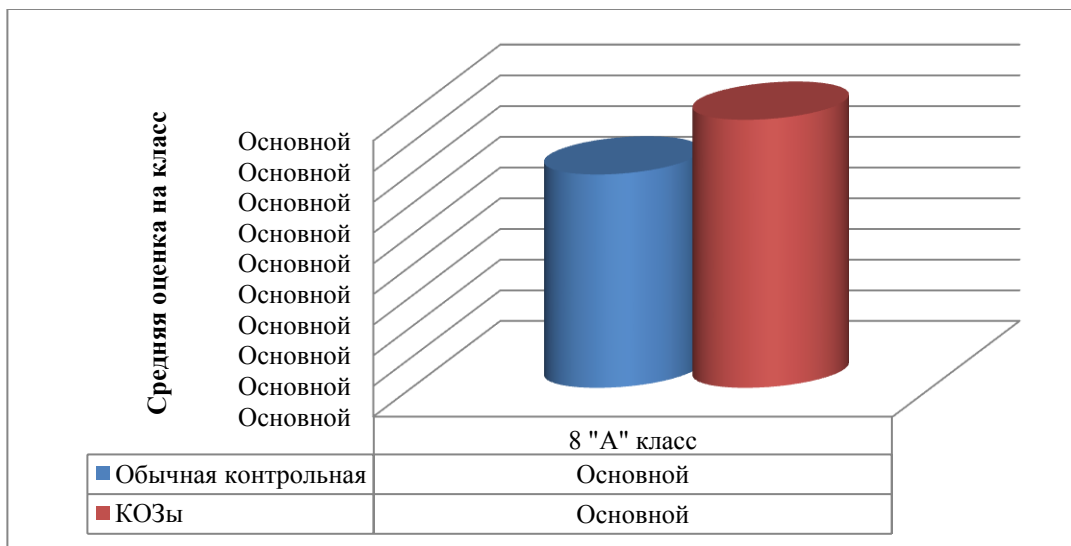


Figure 4. The results of the diagnostics of the academic progress of the pupils of 8 “A” form in MBGEI “Secondary school No. 171”

As it can be seen from the data obtained, the pupils demonstrated better results when being tested with CBT as contrasted to the traditional testing. While comparing the results of tests held in 8 “A” form in MBGEI “Secondary school No. 171”, it can be concluded that with regards to this class, the selection of diagnostic methods really matters. When the pupils are tested by means of CBT, they demonstrate better academic performance.

Before starting testing the pupils, we conducted a survey among the teachers named “Do you use FSES-oriented tasks for diagnosing pupils’ progress?” Ten teachers participated in the survey, six of which gave a positive reply, and four of which gave a negative one (Fig. 5).



Используете ли вы для диагностики знаний учащихся задания, которые соответствуют требованиям ФГОС?	Do you use FSES-oriented tasks for diagnosing pupils’ progress?
Да	Yes
Нет	No

Fig. 5. The results of the survey conducted among the teachers

According to the data obtained, only 60% of the surveyed teachers use the tasks of this kind.

The second question that we posed to the teachers was “What is your attitude to the fact that FSES of the second generation has been introduced to our educational system?” Overall, ten biology teachers of selected educational institutions participated in the survey.



Как вы относитесь к тому, что в систему образования ввели ФГОС второго поколения?».	What is your attitude to the fact that FSES of the second generation has been introduced to our educational system
За	Pro
Против	Contra

Fig. 6. The results of the survey conducted among the teachers

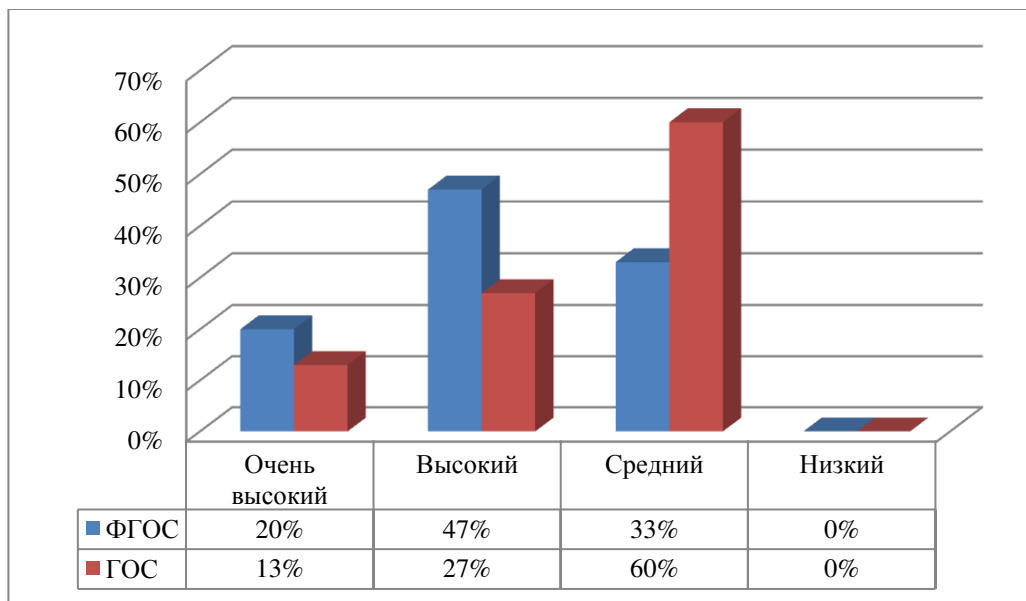
As it can be seen from the obtained results, 80% of the teachers support the idea that the national educational system requires transformations and believe that the introduction of second-generation FSES will be beneficial for boosting pupils' academic achievements. However, 20% of the teachers do not support the idea that the current educational system needs any changes.

The analysis of pupils' commitment to learning was held according to Ginzburg's method of studying

Table 3: The results of pupils' questioning based on Ginzburg's method

The level of learning motivation	MAGEI "Gymnasium No. 139"		MAGEI "Secondary school No. 39"		MBGEI "Secondary school No. 171"	
	FSES-based class	A traditional class	FSES-based class	A traditional class	FSES-based class	A traditional class
Very high	20%	13%	24%	21%	19%	12%
High	47%	27%	35%	31%	57%	33%
Intermediate	33%	60%	41%	47%	38%	55%
Low	0%	0%	0%	1%	0%	0%

In MAGEI "Gymnasium No. 139" of Kazan city (the Volga region), two forms participated in the experiment: 8 "A" (FSES) and 8 "V" (SES) (Fig. 7).



ФГОС	FSES
ГОС	SES
Очень высокий	Very high
Высокий	High
Средний	Intermediate
Низкий	Low

Fig. 7. The results of testing pupils of MAGEI "Gymnasium No. 139" based on Ginzburg's method

According to the data received, the pupils who were taught according to FSES educational program demonstrated twice better performance among all the indicators than those the pupils who were taught based on the FES-oriented program, which conditioned their higher level of motivation.

In MAGEI "Secondary school No. 39 with enhanced education in English" (the city of Kazan), two forms participated in the experiment: 8 "V" (FSES) and 8 "B" (SES) (Fig. 8).

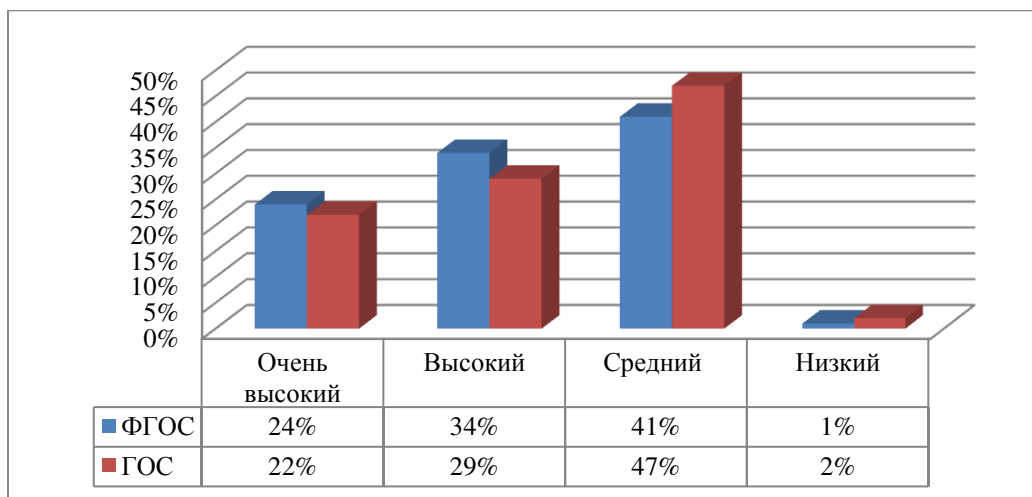


Fig. 8. The results of testing pupils of MAGEI "Secondary school No. 39" based on Ginzburg's method

After that, we performed the same testing at MBGEI "Secondary school No. 171 with enhanced education in particular subjects". Two classes were tested: 8 "A" (FSES) and 8 "G" (SES) (Fig. 9).

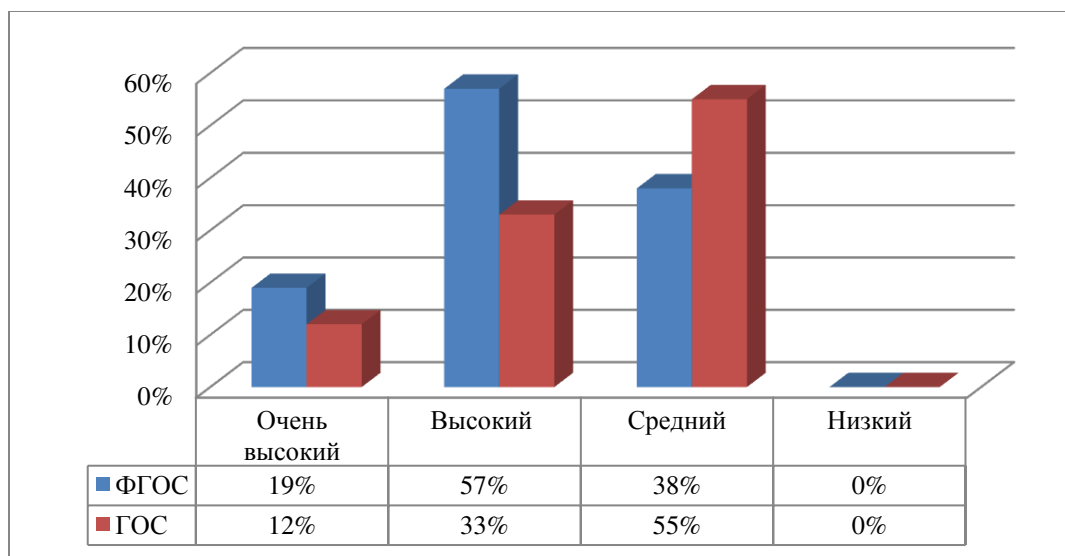
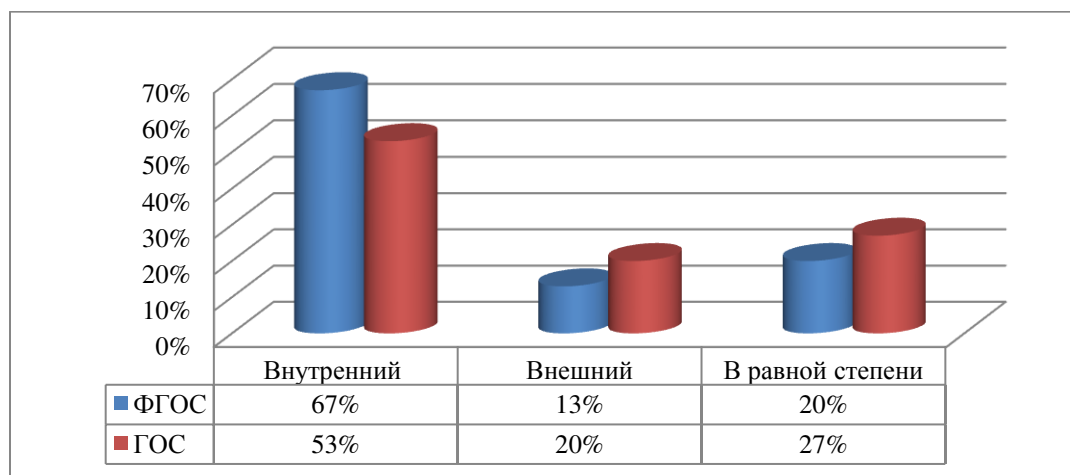


Fig. 9. The results of testing pupils of MBGEI "Secondary school No. 171" based on Ginzburg's method

Based on the data received, it can be said that among the pupils who were taught based on FSES program, the high level of learning motivation was predominating.

Ginzburg's method also implies defining pupils' internal and external academic motivation. This is what creates a stimulus for a pupil's learning.

In MAGEI "Gymnasium No. 139", the same two forms took part in our study: 8 "A" (FSES) and 8 "B" (SES).



ФГОС	FSES
ГОС	SES
Внутренний	Internal
Внешний	External
В равной степени	Equally

Fig. 10. The results of testing pupils with the aim to define their type of learning motivation (conducted in MAGEI "Gymnasium No. 139")

As it can be seen from the results obtained, internal motivations prevail among the pupils who are taught according to the FSES-based program, while external motivations prevail among the pupils who are taught according to SES-based program (Fig. 10).

In MAGEI “Secondary school No. 39”, the same two forms participated in our study: 8 “V” (FSES) and 8 “B” (SES).

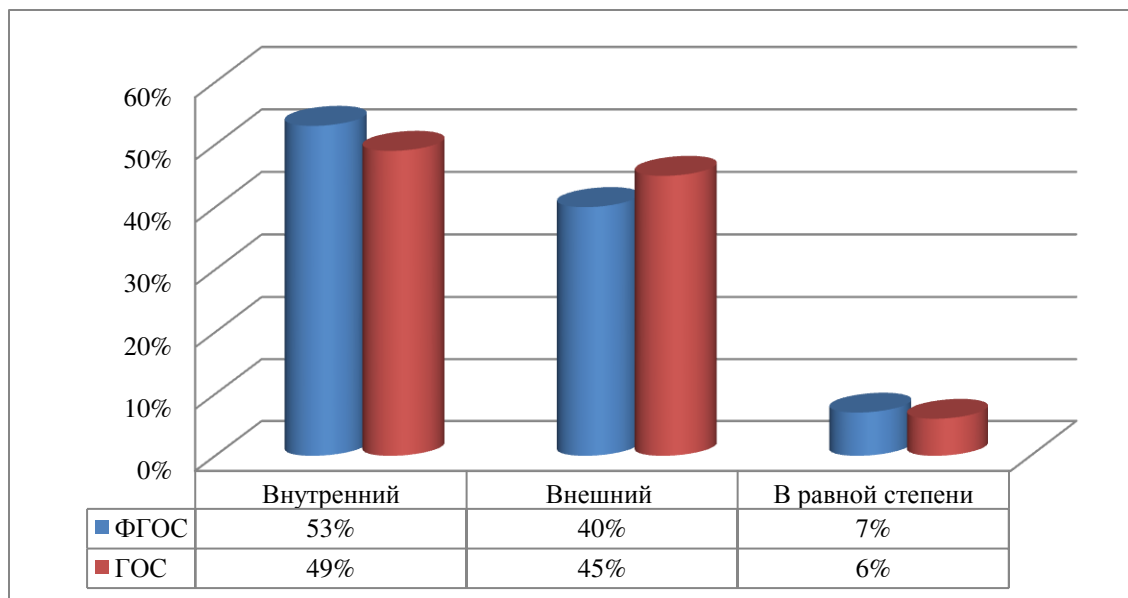


Fig. 10. The results of testing pupils with the aim to define their type of learning motivation (conducted in MAGEI “Secondary school No. 39”)

According to the obtained results, internal motivations prevail in the classes that are taught according to the FSES-based program, while external motivations prevail in the classes that are taught according to SES-based program (Fig. 11).

In MBGEI “Secondary school No. 171”, two forms took part in our study that was aimed at defining the type of learning motivation: 8 “A” (FSES) and 8 “G” (SES).

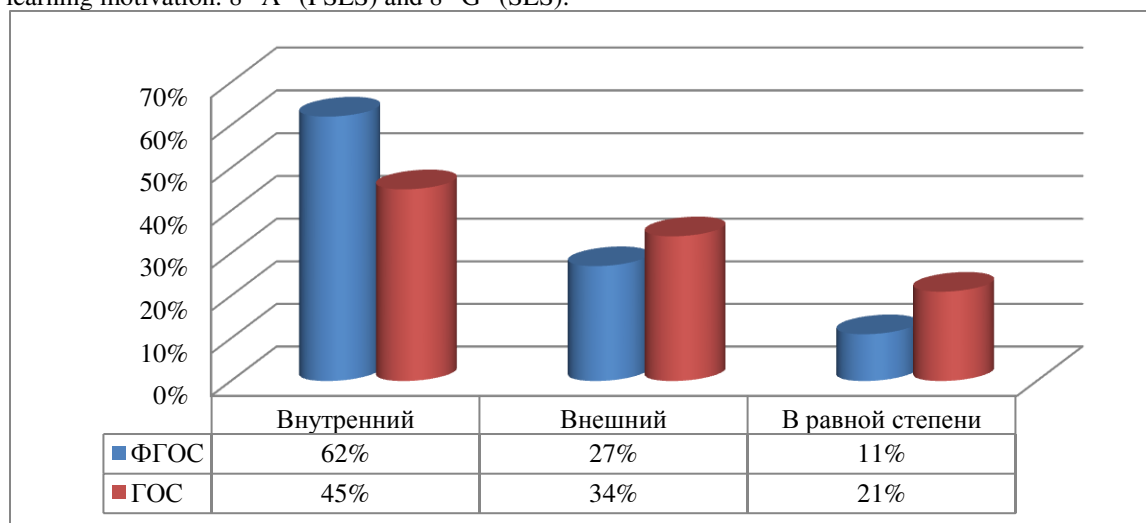


Fig. 12. The results of testing pupils with the aim to define their type of learning motivation (conducted in MBGEI “Secondary school No. 171”)

As it can be seen from the results obtained, internal motivations prevail in the classes that are taught according to the FSES-based program, while external motivations prevail in the classes that are taught

according to SES-based program (fig. 12).

CONCLUSIONS:

1. The application of modern methods of pupils’

diagnostics, designed in accordance with the requirements of the second-generation FSES, allow pupils to achieve better academic results as compared to the traditional testing methods.

2. Those pupils who are taught based on FSES program demonstrate higher commitment to learning.

3. Those pupils who are taught according to the FSES-based program of the second generation mainly have internal motivations for obtaining knowledge. According to Ginzburg's method, this indicates that such pupils will more probably succeed in life and career in the future.

4. The FSES-based program proved to be more effective as compared to the previously introduced one; this is proved not only by the results of our studies, but also by the majority of the teachers polled who believe that FSES-associated innovations introduced to the educational system will benefit the latter.

5. Teachers have to apply the modern means of pupils' diagnostics during the classes because they completely meet the requirements of the second-generation FSES, as well as favor the formation of UAL in pupils.

SUMMARY:

The application of modern diagnostic methods increases pupils' interest to learning and favor the development of key competencies in children, which serve the aim of forming a personality that is able to successfully and comfortably adapt to the new generation society and to effectively interact with it – this is what modern education is primarily aimed at. The programs that are built on the basis of Federal State Educational Standard are beneficial to pupils' commitment to education.

ACKNOWLEDGEMENTS:

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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