**INTERNATIONAL ASSESSMENT TESTS DEVELOPMENT OF FUNCTIONAL LITERACY OF STUDENTS IN KAZAKHSTAN: FIRST RESULTS, EXPERIENCE AND PROSPECTS**

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*The report reviews the problem of estimating the educational achievements of students of secondary schools, especially primary school students.*

*Attention directed to the choice of assessment instrument, its potential and possible use in schools of Kazakhstan.*

**BACKGROUND FOR SEARCH MODERN INSTRUMENT OF QUALITY ASSESSMENT**

Since 2015 of 12- year education will have been implemented in Kazakhstan (1). Transition to 12-year education is due to several reasons as following:

• lack of school education diagnostic goal-setting;

• focus on obtaining formal results, and not on personal development;

• maintaining an outdated system of assessing academic achievement, which is not of a stimulating nature and do not provide an objective and leads to stressful situations.

The solution to these issues lies in the implementation of competence-based approach in school education, in which the goal of education is formulated as a system of expectations as life skills and competencies. In this connection the question of diagnosis and measurement of learning outcomes is paramount among many others pending. Therefore, in Kazakhstan in the period of the first preparatory phase of the 12 - year education research is to be continued on the content and organization of the competency assessment of student achievement (2).

**INSTRUMENT FUNCTION**

One of the modern advanced instruments is monitoring teaching for subject competences of primary school, developed in the Russian Federation on the basis of the achievements of the Russian educational psychology (3,4). This instrument is aimed at evaluation of the process of cultural appropriation of instruments of thought, as the lead content of school education. It provides identification (for schools and regional systems) educational guidance to the educational process and understanding the prevailing here deficits.

Due to the fact that the educational system of the Russian Federation and Kazakhstan have common pedagogical traditions and problems of modern development, it seemed expedient to hold the localization and adaptation of instruments (both in Russian and in Kazakh) for the tasks of monitoring teaching and subject competences of primary schools in the Republic of Kazakhstan.

***Expectations from implementation instruments***

The solution to this problem allows us to:

1. Provide teachers in primary schools in Kazakhstan teaching materials necessary to build educational and subject competences of students.

2. Form the students research skills for use of acquired knowledge in real-life situations.

3. Use the experience gained to develop the instruments for monitoring training - subject competences for other levels of education.

***The content of the instrument***

Research instruments include tests designed to identify training and subject competences of primary schools (the instrument SAM translated from the English *School Achievement Monitoring*) and automated information system SAM (AIS SAM) for the process of measuring educational subject competences, stockpiling, transfer and processing of measurement results (5).

The SAM instrument tests are generated from the matrix of subject content of cognitive activities that constitute the main sections of the specific curriculum standard of education. Therefore, the actual test determines the level of absorption of funds used to meet the challenges.

Used instrument contains action-oriented mode of action of the three levels of the test:

• The first level - reproductive, or formal. Meeting the challenges of this group is based on the acquisition method of action by the rule or algorithm;

• The second level - the reflexive, or substantial, suggests that the test should occur mastering the basis of possible courses of action in a subject area;

• The third level - functional, secured the freedom of choice of the mode of action on the basis of available resources.

Thus, both built on the same academic material are of three types (typology test), which serve as indicators for assigning the appropriate section of the curriculum.

Indicator of the development of the mode of action of ***the first level*** is the ability of a test to solve problems in which the conditions ensure the correct sequence of actions. This is usually common tests.

The development of ***the second level*** in the ability to solve problems that have no direct connection between the condition and the algorithm actions. Conditions can take away from the correct sequence of decisions, including on the grounds of non-traditional form of presentation.

Indicator of the development of the mode of action on the third level is the decision of tasks that need to rethink the conditions so as to see the possibility of using the already known method.

In the SAM instrument to present the results of testing 1,000-point scale has been used obtained for each subject as a result of a special study on the basic sample of students.

SAM is designed to test achievement scale stage version, in which each stage is attributed to the qualitative characteristics, based on the theoretical development of the planned levels. Total allocated 4 levels of achievements, which are defined as follows:

***Zero level***: even the first level has not been mastered. Students who are at this level, can perform tasks at least 50% of the 1st level. Probability of accomplishment of tasks of the 2nd and 3rd levels close to zero.

***First level***: the first level only has been mastered. Students who are at this level, can do no less than 50% of tasks of level 1, but less than 50% of the tasks of the 2nd level. Probability of accomplishment of tasks third level is very low.

***Second level***: to master the second level. Students who are at this level, can do no less than 50% of the task level 2, 80% of tasks for level 1, but less than 50% of tasks off the third level.

***Third level***: to master the third level. Students who are at this level, can do no less than 50% of the jobs the third level. However, they will almost certainly perform any task level 1 and at least 80% of the task level 2.

For a 1,000-point scale used in the test, the following cut-off scores have been defined as follows:

• transition from level 0 to level 1 - 450 grade points;

• transition from Level 1 to Level 2 - 520 grade points;

• transition from level 2 to level 3 - 590 grade points.

Emphasized levels of educational achievements can serve as one of the objective argument for determining school grades.

***Test Parameters***

The test is composed mainly of tasks, each requing a well-defined way of solutions regarding to one of the levels.

Three types of assignment:

1. Multiple choice.

2. Free statement.

3. Additions (and this includes "practical").

The procedure and conditions for testing, methods of processing and interpretation of results are standardized in tests.

Testing is carried out using a test books including the tasks where test taker records the result.

Testing time for one testbook - 90 minutes.

Expected statistical complexity of tasks of Level 1 - 80%, level 2- 50%, level 3 - 20%.

The characteristics of tasks included in the test are given in tables 1 and 2.

|  |  |  |
| --- | --- | --- |
| Substantial units of Math | Total number of tasks | Including levels |
| 1 level | 2 level | 3 level |
| Measurement  | 15 | 5 | 5 | 5 |
| Numbers and Calculations | 12 | 4 | 4 | 4 |
| Elements of geometry | 6 | 2 | 2 | 2 |
| Functional connection | 6 | 2 | 2 | 2 |
| Patterns | 6 | 2 | 2 | 2 |
| Total | 45 | 15 | 15 | 15 |

Table 2. Task data of natural science

|  |  |  |
| --- | --- | --- |
| Substantial units of natural science | Total number of tasks | Including levels |
| 1 level | 2 level | 3 level |
| Biology  | 18 | 6 | 6 | 6 |
| Geography  | 9 | 3 | 3 | 3 |
| Chemistry  | 3 | 1 | 1 | 1 |
| Physics | 18 | 6 | 6 | 6 |
| Total | 48 | 16 | 16 | 16 |

***Using the instrument.***

The results of the investigation indicating a instrument potential SAM on tests made by experts of the Russian Federation without substantive content of the state compulsory standard of primary education of the Republic of Kazakhstan.

The testing of the instrument was carried out on 1978 pupils of the school with Kazakh and Russian language teaching ​​on two subjects: Math and Natural science.

The results of the investigation allowed to verify the content of instrumentations, compliance with standards of RK, solve the issues of quality of presentation of control tasks in Kazakh language.

           Some results of testing the SAM on Mathematics are shown below. The data presented are the results of testing in fifteen 5th grades of eight schools of Akmola region. Among them 6 classes were tested in Kazakh, and 9 classes in Russian language.

***Defining the levels of achievement.***

Table 3 presents the individual test results of students of one class tested.

Table 3. Individual test results on Math of 5E Form students of secondary school № 16 Kokshetau city.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| № | Name | Grades on level | Test grade | Stage of achievement | Confidence interval |
| I | II | III |
| 1 | Assylbek A. B. | 1 | 0 | 0 | 406 | 0 | (372, 441) |
| 2 | Demeuova A. А. | 1 | 0 | 0 | 406 | 0 | (372, 441) |
| 3 | Erekeshova Zh. F. | 2 | 0 | 1 | 431 | 0 | (410, 452) |
| 4 | Zhanbolat A.M. | 6 | 0 | 1 | 453 | 1 | (438, 468) |
| 5 | Kaimuldin E. A. | 0 | 0 | 0 | 0 | 0 | (, ) |
| 6 | Mussabek F. S. | 2 | 0 | 1 | 431 | 0 | (410, 452) |

According to the table we can say that the majority of students in this class do not even mastered the first level. 8 out of 9 students in the class are at zero level, since they can perform tasks at least 50% of the 1st level.

The results, presented in a form that may be of interest to teachers and school administrators.

Figure 1 shows the distribution of students of eight schools of Akmola region by level of achievement. On the horizontal axis the percentage of students who are at each stage on average at school, and the vertical axis of the school. Most students are on the first stage (pink stripe), this corresponds to the development of the first level. In this regard more than a third of pupils of school № 12 and № 16 on average are at zero level and have mastered even the first level.

Fig.1. Assignment of participants by level of achievements in different schools.

Studies strongly suggest that more than 70% of students are on the first level. On average for all schools 72% of pupils have mastered the first level. In some classes, all students have mastered the Level 1 (100%). All of the children in these classes are able to act on the model and solve typical problems, but comprehension and understanding of the mode of action to meet the challenges of the second level is not happening.

***Defining the success profiles of the assimilation of educational material***

           SAM test provides a structural characteristic of the estimated competence: its three-dimensional profile. Profile shows the percentage of the material has been assimilated in each of the three levels, that is, of what constitutes a particular integral result, divorced three subscales.

  Profile is based on the primary (interest) points obtained for each level. It is not the result of measurement, but only a relative measure capturing assignments of each level in this test. However, the simplicity of construction and interpretation make it very useful. All the more so profiles and their changes in the course of monitoring the most directly and emphatically show the process of assigning the educational content.

Figure 2 shows the profiles of two forms of school № 16. Thus, these graphs allow us to conclude that the two forms in the same school show completely different results. 5E Form inferior 5B Form in solving tasks of all levels. Perhaps in this school it is practiced selection of students for the first class. In any case, the school administration and the teachers of these classes will be able to explain the reasons for these differences in the success of their classes.

Fig. 2. Profiles 5B and 5E Forms school №16.

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A comparison of profiles is particularly important when it refers to forms that have similar average initial scores, that is, testing showed similar results on average.

Assimilation profile can be constructed for the individual sections of the program, which will evaluate the nature of their learning and thereby highlight the quality of their specificity as an object of learning.

By normative assessment of profile, it should be noted first of all, the position of L.S. Vygotsky, according to full development of cultural models of the child is a process that the time goes beyond passing an appropriate educational program.

**BRIEF SUMMARY**

Full interpretation of the measurement of learning outcomes requires knowledge of the many features of the educational situation in school and region. Some of this information can not generally be achieved by existing methods, and is available only to those who work directly at school or school system. So meaningful interpretation and assessment of test results - the business of the practice of education - teachers, school administrators, and local education authorities.

Today, there are many different pedagogical approaches, how to respond to the results of students' educational achievements, that is, in which direction to adjust teaching strategies. Each of them has proved to be effective for certain conditions. These include local and educational traditions, and social and psychological environment in specific schools, and a cash level of children, and the attitudes of parents, and the characteristics of professional qualifications of the teaching staff, and more. Accounting for all of these circumstances can be done only for those who have lived and worked.

 But in order to estimate the state of the educational process is adequate, and the conscious decision - it is important to rely on data of objective educational assessment, fixing the results of the educational process in the essential definitions. And here the practice of education is useful test SAM, combining the ability to measure and structural qualification academic achievement.

**PROSPECTS**

Prospects for development of the instruments. In the future a lot of work with researchers - teachers in primary and 5th Form to use the results in the adjustment of the educational process in the classroom. But most importantly - to form a group of teachers who are able and willing to participate in the development of the instrument.

The specialists of the regional service quality assessment, the Center for Independent Education Quality Assessment in LLP «BBS-IT» (operates under three-way contract for the development and implementation of regional educational monitoring system) have assimilated the development technology of tests in the paradigm and practice of measuring, which will be used in further work to establish an independent meters for other items.

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