TRANSITION TO SECONDARY EDUCATION IN TURKEY OVER 20 YEARS AND ITS REFLECTION ON MATHEMATICS QUESTIONS

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INTRODUCTION

One of the most important components of the education system is measurement and evaluation activities. According to Baykul (2000), education is a system that improves human behavior. The elements of this system can be listed as input, process, output and evaluation. Input in the education system consists of many factors such as the student's prior learning, readiness, the characteristics of the educational environment and the teacher. The process is the activities carried out during the implementation of the educational program, in other words, educational situations. The output is the knowledge and skills acquired by the student at the end of the education process. The evaluation, which is the last stage of the system, is quite important for the determination of the problems in the system and the development of the system. The control of the education system is possible through assessment and evaluation. The assessment provides valuable information about to what degree the objectives are achieved, and evaluation activities play a role in making some decisions (Carter & Norwood, 1997). Besides in-class assessment activities to measure student success, central exams are also required. The general purpose of all educational institutions is to prepare students for the profession, business life or the next level of their educational life by their interests and abilities (Gedikoğlu, 2005). Central placement exams have always existed in our country. To meet the strong interests of students in these institutions, especially in high school and university preferences, there is a requirement for an objective assessment and evaluation system that accurately measures their knowledge levels and predisposition to the department (Şad & Şahiner, 2016). Although these exams are milestones in students' lives, they are also an important assessment tool in determining the success level of students.

Along with national central exams, international exams are also held in our country. International exams such as PISA (Programme for International Student Assessment),

TIMSS (Trends in International Mathematics and Science Study), and PIRLS (Progress in International Reading Literacy Study), which are applied to measure the high-level mental characteristics of students and to guide the education policies of countries, aim to monitor the progress of participating countries in science, mathematics and reading skills (İncikabı et al., 2016). Since 2003, Turkey has been participating in the PISA exam, which has been held every three years since 2000. The PISA exam aims to determine the level of 15-year-old students to have the basic knowledge and skills necessary to keep up with the era. With the data obtained from the PISA exam, participating countries can also find the opportunity to evaluate their education and training systems. Exams such as PISA are held at an international level. However, since such exams are held in many countries in a common framework, a national exam was required. Similar to the PISA exam, the ABIDE (Monitoring and Evaluation of Academic Skills) Project has been held in our country since 2016 (MEB, 2019a).

The outputs of the central exams are both taken as a reference in guiding education policies and used to place students in a higher education institution in our country, as in many countries (Özer-Özkan & Acar-Güvendir, 2018). As in our country, the secondary education placement system in the world is carried out by taking the results of the central exam as a criterion, but there are also different procedures. In some countries such as Singapore, China, France, Russia, and Italy, students are placed at the end of secondary school according to the results of the final exam, however in Germany and India, the school and family decide together (Ulusoy, 2020). In some states of the United States, the address factor is taken into account, and in England, students are placed in the school closest to their address with the preference guide offered to families without a central exam. School graduation scores are taken into account for placement in secondary education institutions in Finland (Ulusoy, 2020). The methods used by different countries in transition to secondary education are given in Table 1 in detail. In Turkey, central assessment and evaluation for placing students in secondary education institutions are carried out by national exams by the Ministry of National Education.

Table 1: Systems Used by Some Countries in Transition to Secondary Education

Country	Exam			School Performance		Address Based Registration System
	School Graduation Exam	Central Placement Exam	School-Based Placement Exam	School Grades	Teacher Reviews	
USA		✓				✓
England			✓			✓
Japan		✓	✓	✓		
Hungary		✓	✓	✓		
South Korea		✓		✓		
Holland		✓				
China	✓					
France	✓			✓	✓	
Russia	✓					
Italy	✓					
Denmark	✓		✓			
Singapore	✓			✓		
Switzerland			✓	✓	✓	
Germany				✓	✓	
Finland				✓		
India					✓	

(Demir & Yılmaz, 2019)

Some researchers on central exams stated that elimination is compulsory due to the factors such as Turkey's growing population and inadequacy of the current infrastructure as a result of that, the limited number of qualified schools and shortage of teachers (Büyüköztürk, 2016). On the other hand, there are also researchers who argue that the evaluation of all students with the same central exam will deepen the existing inequality of opportunity (Yılmaz & Altınkurt, 2011). Although the cancellation of the student placement exam in secondary education institutions has been discussed for years, it is seen that every changing system is a new exam.

***Figure 1**: Changes in the Ministry of National Education and Secondary Education Examinations Between 2003-2022.*

In order to overcome the problems in selecting and placing students in secondary education institutions in Turkey, different central examination systems have been tried. Factors such as failure of previous systems to meet expectations, conversion of regular high schools to Anatolian high schools as of 2010, and extension of compulsory education to 12 years with the 4+4+4 regulation implemented in 2012 have increased the discussions on the transition to the secondary education system. These exams are also a prerequisite for transitioning to a higher level along with their role in determining the student levels and success. An accurate and objective assessment-evaluation system has been required to determine student success. For this purpose, five different central examination systems have been used since 1998 for the transition to secondary education. As can be seen in Figure 1, these exams are High School Entrance Exam (LGS), Secondary Education Institutions Selection and Placement Exam (OKS), Level Determination Exam (SBS) held in 6th, 7th and 8th grades, Transition from Basic Education to Secondary Education (TEOG) and lastly, the High School Transition System (LGS), which is held only in the 8th grade.

LGS (High School Entrance Exam)

With the transition to 8-year uninterrupted compulsory education in 1998, it was combined with the Anatolian High School Entrance Exams held at the end of primary school and held under the name OÖKÖSYS (Secondary Education Institutions Student Selection and Placement Exam). Since this name is too long, it was shortened to LGS, that is, High School Entrance Examination. After 8-years of compulsory education, the secondary school sections of Anatolian high schools were closed. With this arrangement, students participated in the high school placement exam LGS to be placed in Anatolian high schools and science high schools. The test included 25 questions from each of the Turkish, Mathematics, Science, and Social Studies courses and the duration of the exam was 120 minutes. The results obtained in LGS were effective in placements in secondary

education institutions until 2004 (Görmez & Coşkun, 2015). In the 2004-2005 academic year, this exam was named OKS (Secondary Education Institutions Selection Exam and Placement Exam).

OKS (Secondary Education Institutions Selection and Placement Exam)

Between 2004 and 2008, the Secondary Education Institutions Selection and Placement Exam was held by the Ministry of National Education to select and place students in private and public high schools. This exam was given to 8th-grade students in a single session in which they were responsible for Turkish, Mathematics, Science and Technology, and Social

Studies courses. As the distribution of questions in the exam can be seen in Table 2, a total of 100 questions were asked, 25 from each course, and the students were asked to answer these questions within 120 minutes. Since the examination was before introducing the 12-year compulsory education (4+4+4) in 2012, students were held responsible for the 6th, 7th and 8th-grade curriculum, the second level of primary education. With the scores they got from OKS, they were able to apply to the following schools (MEB, 2008).

- •Turkish and Foreign Private Schools
- •Anatolian High Schools
- •Science High Schools
- • Social Sciences High Schools
- • Anatolian Teacher High Schools
- • Anatolian Technical and Anatolian Vocational High Schools
- • Vocational High Schools Affiliated to Institutions
- • Police College (Qualification Exam)

The number of questions and weighted coefficients of the courses in OKS are given in the table below.

Table 2: Number of Questions and Weighted Coefficients of Courses in OKS

	Number of Questions	TM Coefficients	MS Coefficients
Turkish	25	3.5	3
Mathematics	25	3.5	4
Science and Technology	25	2.5	4
Social Studies	25	2.5	1
Total	100		

(MEB, 2008)

As can be seen in Table 2, the most significant subtest in both TM (Turkish-Mathematics) and MS (Mathematics-Science and Technology) score types are the Mathematics test. Turkish in the TM score type and Science and Technology course in the MS score type

are the most significant tests with the Mathematics course. It is understood from the table that the mathematics test questions constitute 25% of the total questions.

It was observed that students' interest in learning at school decreased in the secondary education placement system according to the OKS score. School absenteeism has also increased since final year students focus on private lessons and private teaching institutions (Atılgan, 2018). To solve this problem, primary school success scores were added as 7% of the placement score, as well as the scores they got from OKS as of 2007 (Atılgan, 2018). OKS was held all over Turkey and in various countries abroad to place students in secondary education institutions from 2005 to 2008-2009 academic year. The fact that OKS is a single test consisting of multiple-choice questions applied in the last year of secondary education and discussions on the pressure and stress of having students' futures rely on such a single test led to the change of this model in 2009 (Atılgan, 2018). In 2008, while 8th-grade students were taking the final OKS exam, 6th and 7th-grade students took the SBS exam in line with the OGES (Secondary Education Transition System), which was newly introduced (MEB, 2015). After 4 years of OKS, SBS was introduced.

SBS (Level Determination Exam)

Instead of OKS, which has been held since 2005 in the transition to secondary education institutions, SBS was introduced in 2009 within the scope of OGES. Unlike OKS, SBS was held until 2013 as a model consisting of multiple-choice tests given in 6th, 7th and 8th grades instead of a single test given in the last year, and again, unlike OKS, foreign language questions were also included. Secondary school placement score consists of the weighted combination of SBS results and school success scores within the scope of OGES. At the end of the 6th, 7th, and 8th grades, SBS was held by the Ministry of National Education, limited to the achievements in the curriculum of those years. The number of questions and weighted coefficients of the courses in SBS are shown in Table 3.

Table 3: Number of Questions and Weighted Coefficients of Courses in SBS

	Number of 6th Grade Questions	Number of 7th Grade Questions	Number of 8th Grade Questions	Weighted Coefficients
Turkish	19	21	23	4
Mathematics	16	18	20	4
Science and Technology	16	18	20	3
Social Studies	16	18	20	3
Foreign Language	13	15	17	1
Total	80	90	100	

(MEB, 2013)

As can be seen in Table 3, Mathematics subtests constituted 20% of all questions in each of the 6th, 7th and 8th-grade tests, and it is seen that the ratio of mathematics questions to total questions decreased compared to the OKS exam (25%). This can be explained by including the foreign language subtest in the exam. Also, the weighted coefficients of the Mathematics and Turkish subtests are higher than the other courses. The mathematics subtests maintain their characteristics of being one of the significant subtests as in OKS.

In SBS, 70% of the score taken basis for placement is composed of SBS scores, 25% is primary school success score and 5% is conduct grades. However, in 2010, adding the conduct grade to the placement score was stopped by the Council of State. Thus, SBS continued until 2013 with the calculation of the placement score by adding 70% SBS score and 30% primary education success score. In 2013, SBS was canceled and replaced by TEOG due to the criticism that the psychology of the students is negatively affected by the exams held every year at young ages and every grade level (Atılgan, 2018). On the other hand, SBS was gradually abolished as of 2010. It was held only for 8th-grade students in 2012 and later (Atılgan, 2018).

TEOG (Transition from Primary Education to Secondary Education)

With the transition to the 4+4+4 education system in 2012, the TEOG exam system was introduced instead of the SBS to end exam anxiety in students and eliminate the widespread private teaching activities (Pura, 2020). TEOG, which was held since the 2013-2014 academic year, was a central and multiple-choice exam consisting of one of the semester exams of each of the six basic courses namely Turkish, Mathematics, Science and Technology, Turkish Republic Revolution History and Kemalism, and Religious Culture and Foreign Language courses (MEB, 2016). Since the central exam held in this way was also accepted as one of the written exams included in the students' end-of-term grades, a placement period started with TEOG, in which not only students who request it, but all students have to take the exam.

The simultaneous practice of the domestic curriculum, increasing the role of schools and teachers, spreading the evaluation of school success to the education process and decreasing absenteeism are among the purposes of transition to the TEOG exam system. Also, evaluation of teachers' performance is one of the purposes. The TEOG system is aimed to prevent students who have valid excuses from losing their rights by taking the make-up exams (Buluç et al., 2014). To reduce exam stress, students were allowed to take TEOG in their own schools. Thus, it is aimed to eliminate the exam pressure that may occur in students. On the other hand, the courses that students are responsible for in TEOG are basically the same as SBS. Also, wrong answers do not affect the correct answers in this exam. The main reason for this situation is that the wrong answers do not affect the correct answers of the students in the exams they attend at schools, and the central assessments are not different from the written ones. In Table 3, the number of questions and weighted coefficients of the courses in TEOG are shown below.

Table 4: Number of Questions and Weighted Coefficients of Courses in TEOG

	Number	Weighted Coefficients
Turkish	20	4
Mathematics	20	4
Science	20	4
Religious Culture and Moral Knowledge	20	2
T.R. Revolution History and Kemalism	20	2
Foreign Language	20	2

(MEB, 2016)

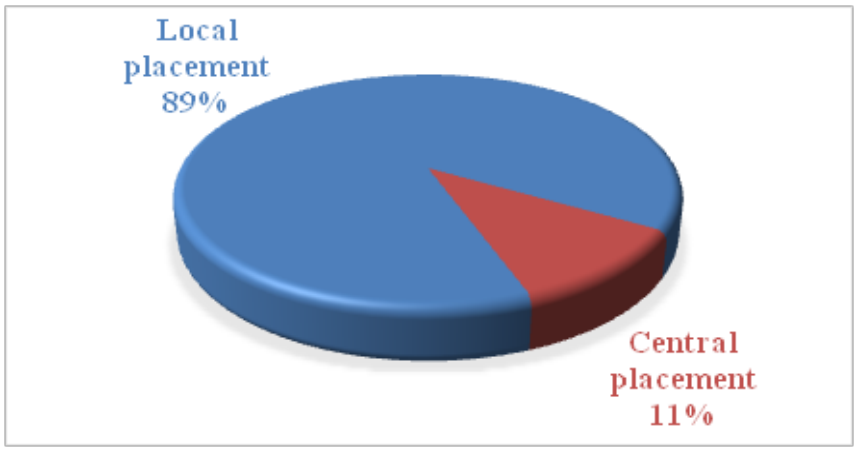
When the weighted coefficients of the courses in TEOG are examined in Table 4, it is seen that the coefficient of the Science course increased, unlike SBS while the coefficient of the T.R. Revolution History and Kemalism course decreased. It is seen that Turkish, Mathematics and Science courses are more significant in student placement. On the other hand, while 20% of the questions in the SBS are math questions, it was 16.6% in the TEOG exam. Giving additional points to students who were successful in the international science olympiads and mathematics olympiads held by TUBITAK (The Scientific and Technological Research Council of Turkey) also increased the importance of the mathematics course (MEB, 2016). As a result, private teaching institutions were closed in 2012 with a radical, important and positive decision, then the TEOG system was introduced in transition to secondary education and it was expected that there would be no need for private teaching institutions. TEOG was held as an achievement test. However, although the private teaching institutions were closed, TEOG, which all secondary school students were obliged to take, could not eliminate the need for exam preparation, and the closed private teaching institutions were replaced by other means. It was discussed that students taking an exam once in each term of the eighth grade and also the fact that there were too many students in the first rank might cause psychological problems and using TEOG for placement, which was an achievement test, was also criticized. Therefore, TEOG was canceled in 2017. It was announced that 90% of high schools will be placed based on the address and 10% will be placed by central examination (Atılgan, 2018).

LGS (High School Transition System)

With the change in 2017-2018, LGS was introduced instead of TEOG in transition to secondary education. However, the replacement of TEOG took place very quickly and the details of the system to be replaced were not clearly defined. Therefore, the stages of the new exam have shaped over time. This situation also negatively affected the communication between students, teachers, and parents (Aslan, 2021). With LGS, the optional examination system, held once a year, has been brought back. Also, the calculation of the raw score of each course test by subtracting one-third of the number of wrong answers from the number of correct answers for the relevant test was introduced again.

It is stated that both centralized examination and placement without examination can be made in the new placement system in secondary education institutions after the cancellation of the TEOG system. It has been announced that there will be an address-based placement without a central exam or exam result among the students who have completed secondary school (MEB, 2019b). After the announcement of LGS central exam scores, students are placed first according to their central placement scores and then according to the local placement system. In Figure 2, the percentages of the systems in which the students were placed according to the LGS placement results of the 2017-2018 academic year are given.

***Figure 2**: 2017-2018 Academic Year LGS Distribution of Students by Placement Types*



(Coşkun et al., 2020)

LGS is held in two sessions. In LGS, students attend two different sessions on the same day, in the morning and at noon. In the first session of the LGS central exam, tests consisting of verbal lessons were included. These are Turkish, Revolution History and Kemalism, Religious Culture and Moral Knowledge, and Foreign Language (English) tests. In the second session, tests are consisting of numerical lessons. These include science and mathematics tests. The achievements in the 8th-grade curriculum for each course are taken as a basis in the central examination (LGS). Questions that can measure students' reading comprehension, interpretation, problem-solving, analysis, deduction, critical thinking, scientific process, and similar skills are included (MEB, 2019c). In Table 5, the number of questions and weighted coefficients of the courses in LGS are shown below.

Table 5: Number of Questions and Weighted Coefficients of Courses in LGS

		Number of Questions	Weighted Coefficients
First Session	Turkish	20	4
	Religious Culture and Moral Knowledge	10	1
	T.R. Revolution History and Kemalism	10	1
	Foreign Language	10	1
	Total	50	
Second Session	Mathematics	20	4
	Science	20	4
	Total	40	

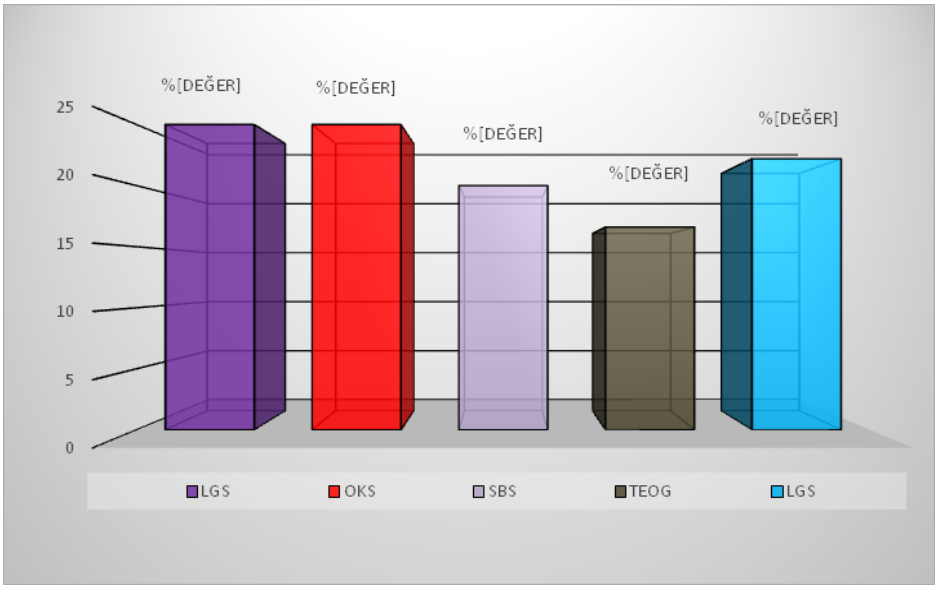
(MEB, 2019c)

When the weighted coefficients of the courses in LGS are examined in Table 5, it is seen that the coefficient of the T.R. Revolution History and Kemalism, Foreign Language, and Religious Culture and Moral Knowledge courses also decreased, unlike TEOG. It is also seen that Turkish, Mathematics, and Science courses continue to be more significant in student placement. On the other hand, while 16.6% of the questions in TEOG were math questions, 22.2% of them in the LGS exam are math questions. In LGS, held for the first time in 2018, the first session lasted 75 minutes and the second session lasted 60 minutes. However, as a result of feedback such as the fact that the skill-based questions asked in LGS were longer and more difficult than the previous exams, the duration of the second session, including the mathematics test, was increased to 80 minutes in LGS in 2019. It was seen that there is a positive relationship between the time given for solving questions in standard tests and student scores (Frisby & Traffanstedt, 2003).

Reflections of Changes on Math Questions

It is concluded from the examination of five different exam systems used for the transition to secondary education in the last 20 years that different systems have been practiced in terms of both the number of questions in the courses and the weighted coefficients of these tests. In Figure 3, the percentage of Mathematics test questions according to all questions in the exams is given.

***Figure 3**: Percentage of Mathematics Questions in Exams*



Considering both the ratio of the questions in the mathematics tests to all the questions and the coefficients of the mathematics tests, it is understood how important the mathematics lesson is in the transition to secondary education. From the perspective of the mathematics curriculum, it is seen that the questions in these exams are prepared by considering all learning domains. Students were tested in terms of numbers and operations, algebra, geometry and measurement, data processing and probability learning domains (MEB, 2018). With the questions in the Numbers and Operations learning domain, students are expected to be able to perform operations on natural numbers, integers and rational numbers and to solve problems related to them. It is aimed to solve algebraic expressions, identities, factorization, linear equations and quadratic equations and inequalities, and related problems in the algebra learning domain. In the geometry and measurement learning domain, it is expected to know the basic geometric concepts, the features of two and three-dimensional shapes and to solve the problems related to them. As for Data Processing, it is expected to prepare tables and graphs with appropriate data and interpret them. In the probability learning domain, it is expected to calculate the probable states of an event and the probabilities of events with different probabilities. National or international exams cover the achievements that are appropriate for the age of the students. The quality of the questions in the exams is also of great importance (Uğurel et al., 2012).

One of the main purposes of mathematics education is to develop the problem-solving skills of individuals (Baki, 2008). In order to provide students with problem-solving skills, they must first be left alone with the problem situations. To achieve this, the problems given in the class are important (Gök & Erdoğan, 2017). Some studies in the literature show that students have difficulties in non-routine problem solving (Çelik & Güler, 2013). All these situations should be considered in mathematics education.

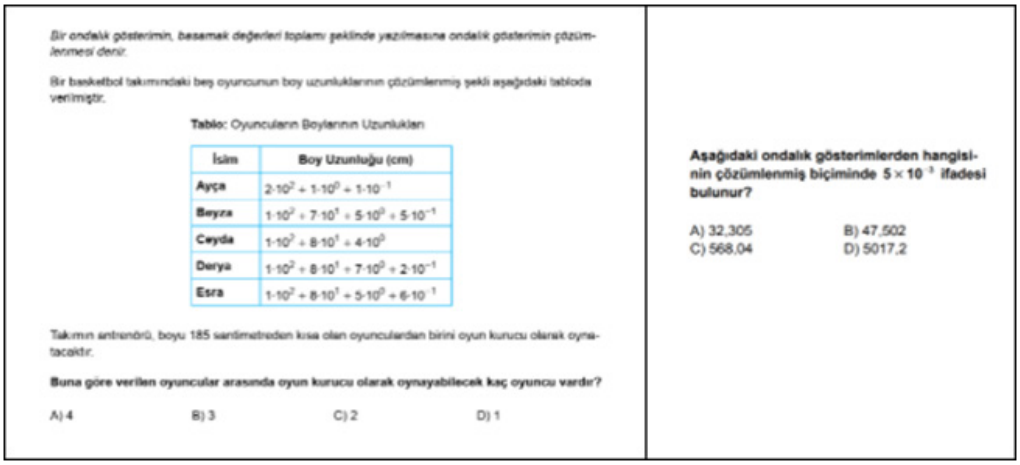
In the analysis of mathematics questions in SBS, it was seen that the questions generally

had an operational structure and were generally at low levels in terms of PISA proficiency level (İskenderoğlu et al., 2013). In a study investigating the opinions of primary school mathematics teachers, Durmaz (2009) revealed that views of primary school mathematics teachers' on SBS were generally positive and that the textbook was adequate in terms of SBS. It is seen that most of the questions in the TEOG exam are at levels 1 and 2 in terms of TIMSS levels, and very few questions are at level 4, which is a high level. According to Bloom's taxonomy, most of the questions were in the domain of application (Başol et al., 2016), more questions were asked in the cognitive domain of application, and fewer questions were asked in the cognitive domain of reasoning (Delil & Yolcu-Tetik, 2015). It is understood that the questions are generally composed of knowledge and practice levels and higher-level thinking skills are less involved (Çalışkan et al., 2018). Although the TEOG mathematics subtest is suitable for the mathematics curriculum, not all achievements in the curriculum could be measured in the exam (Bağcı, 2016). In their study, Mutlu and Akgün (2016) examined the relevance of mathematics questions to real life. They found out that while the ratio of mathematics questions asked in exams was 35% between 1998 and 2008, it was 61% between 2009 and 2013, which nearly doubled compared to previous years. They stated that while most of the questions asked about real life in the first years were in the domain of numbers and operations learning and the personal context, in the following years the questions spread to every learning domain and the questions asked in the social, professional and scientific context increased.

It is noticed in the analysis of question structures that LGS and PISA questions are similar to each other in terms of qualities such as problem-solving, analysis and reasoning. Yaprakgül (2019) stated that, as in PISA and TIMMS, the questions to be answered with logical thinking ability are more in 2018 LGS than in previous years, whereas Erden (2020) stated that the reference point of LGS questions is PISA. It is seen that the questions are adequate in measuring problem-solving, association and reasoning at a rate of 74%, and that the students prepare for LGS by solving the questions in exams such as PISA and TIMSS (Güler et al., 2019). Ekinci and Bal (2019) concluded that 60% of the questions in LGS are at the level of application and analysis, one of the higher-level cognitive processes.

Mathematics questions in LGS are different from exams in previous years. Long exam questions, multiple achievements and insufficient exam time have also become a topic of discussion. Some studies show that the difficulty and complexity of math questions in LGS can negatively affect students (Beyefendi, 2018). LGS and TEOG questions about the same achievements are given in Figure 3 (Resolving decimal representations of numbers using integer powers of 10) and Figure 4 (Writing mathematical sentences suitable for daily life situations involving inequality with a first-order unknown) below.

***Figure 3**: Sample Questions from LGS 2020 and TEOG 2016-1*



Bir ondalık gösterimin, basamak değerleri toplamı şeklinde yazılmasına ondalık gösterimin çözümlenmesi denir.

Bir basketbol takımındaki beş oyuncunun boy uzunluklarının çözümlenmiş şekli aşağıdaki tabloda verilmiştir.

Tablo: Oyuncuların Boylarının Uzunlukları

İsim	Boy Uzunluğu (cm)
Ayça	$2\cdot10^2 + 1\cdot10^0 + 1\cdot10^{-1}$
Beyza	$1\cdot10^2 + 7\cdot10^1 + 5\cdot10^0 + 5\cdot10^{-1}$
Ceyda	$1\cdot10^2 + 8\cdot10^1 + 4\cdot10^0$
Derya	$1\cdot10^2 + 8\cdot10^1 + 7\cdot10^0 + 2\cdot10^{-1}$
Esra	$1\cdot10^2 + 8\cdot10^1 + 5\cdot10^0 + 6\cdot10^{-1}$

Takımın antrenörü, boyu 185 santimetreden kısa olan oyunculardan birini oyun kurucu olarak oynatacaktır.

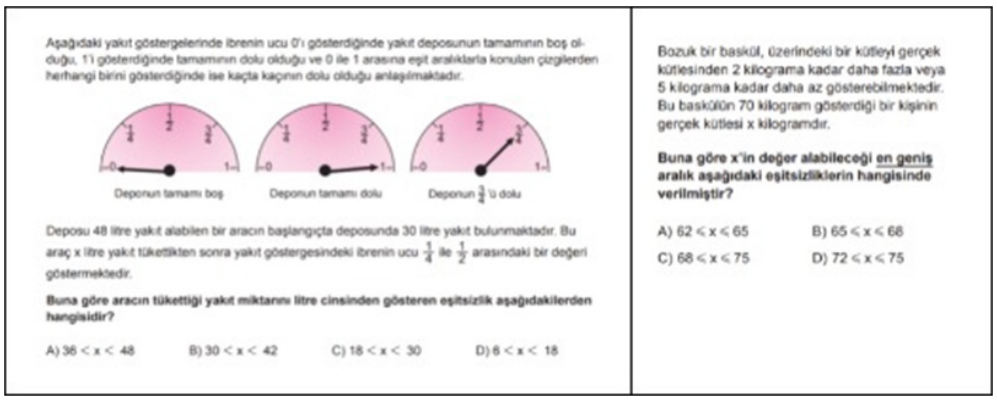
Buna göre verilen oyuncular arasında oyun kurucu olarak oynayabilecek kaç oyuncu vardır?

A) 4 B) 3 C) 2 D) 1

Aşağıdaki ondalık gösterimlerden hangisinin çözümlenmiş biçiminde 5×10^{-3} ifadesi bulunur?

A) 32,305 B) 47,502
C) 568,04 D) 5017,2

***Figure 4** : Sample Questions from LGS 2021 and TEOG 2016-2*



Aşağıdaki yakıt göstergelerinde ibrenin ucu 0'ı gösterdiğinde yakıt deposunun tamamının boş olduğu, 1'i gösterdiğinde tamamının dolu olduğu ve 0 ile 1 arasına eşit aralıklarla konulan çizgilerden herhangi birini gösterdiğinde ise kaçta kaçının dolu olduğu anlaşılmaktadır.

Deponun tamamı boş Deponun tamamı dolu Deponun $\frac{3}{4}$'ü dolu

Deposu 48 litre yakıt alabilen bir aracın başlangıçta deposunda 30 litre yakıt bulunmaktadır. Bu araç x litre yakıt tükettikten sonra yakıt göstergesindeki ibrenin ucu $\frac{1}{4}$ ile $\frac{1}{2}$ arasındaki bir değeri göstermektedir.

Buna göre aracın tükettiği yakıt miktarını litre cinsinden gösteren eşitsizlik aşağıdakilerden hangisidir?

A) $36 < x < 48$ B) $30 < x < 42$ C) $18 < x < 30$ D) $6 < x < 18$

Bozuk bir baskül, üzerindeki bir kütleyi gerçek kütlesinden 2 kilograma kadar daha fazla veya 5 kilograma kadar daha az gösterebilmektedir. Bu baskülün 70 kilogram gösterdiği bir kişinin gerçek kütlesi x kilogramdır.

Buna göre x'in değer alabileceği en geniş aralık aşağıdaki eşitsizliklerin hangisinde verilmiştir?

A) $62 \leq x \leq 65$ B) $65 \leq x \leq 68$
C) $68 \leq x \leq 75$ D) $72 \leq x \leq 75$

As can be seen from the examples in Figure 3 and Figure 4, the questions in LGS are more complex and longer than the questions in TEOG. It can be said that it requires more intensive interpretation and reasoning to solve the questions in LGS. Minister of National Education Selçuk (2019) stated that questions based on memorization are asked in LGS and said, *"There are questions that require skills such as interpretation, reasoning, critical thinking, reading comprehension, and deduction. The content of LGS actually contributes to the improvement of the education system. Because the perspective of the problem is changing. In the past, there was only the possibility of solving a question by memorizing the template of a question, but now reading comprehension has become such a priority that children constantly need to read books on topics they love."* In the study conducted by Güler et al. (2019), it was found out that the LGS questions were 74% adequate in measuring problem-solving, association and reasoning. However, in their study, Karakılıç and Arslan (2018) revealed that there was no significant relationship between students' book reading levels and their academic success in mathematics and problem-solving skills. The reason for this was shown as the fact that the students did not read the books consciously and with understanding. In the study conducted by Göktaş (2010), it was found that reading comprehension skills affect success in mathematics lessons. In another study, when the attitudes of students towards reading were examined, it was concluded that the grade point averages and school successes of the students who love to read are higher than the students who do not like to read (Yılmaz, 2012).

CONCLUSION

When the exams are evaluated as a whole, it can be said that each exam has strengths and weaknesses. For example, in OKS, students were responsible for all 6th, 7th and 8th-grade curriculum. Since SBS was held in 6th, 7th and 8th grades, it assessed the process of success, not the result, and it also has the feature of monitoring and evaluation, but taking the exam every year creates pressure and stress on students. In the TEOG system, taking the exam in their own school and make-up exams were found to be very useful, while taking the exam every semester in the last year and the fact that these exams were compulsory were considered their negative aspects. The questions in LGS, which replace the TEOG system, consist of skill-based questions similar to PISA questions. Instead of memorizing question patterns, it focuses on skills such as reading comprehension, analysis, synthesis, interpretation and reasoning. It is understood that process-based assessment of students and giving a single exam can increase students' anxiety and study load in LGS, as in SBS and TEOG systems. Also, the absence of a make-up exam in LGS is another discussion point. The low number of qualified high schools also creates a more intense competitive environment among students, which negatively affects them.

Remarkably, the mathematics questions are the determinant and elimination element of this exam. It is understood that the questions can be solved by students who have reasoning and judgment skills and read a lot of books. Although the question style given at the end of the unit in the textbooks and the question styles in LGS are quite different from each other, this is compensated by the sample questions published by the Ministry of National Education. However, textbooks must also be adapted to the current examination system. It is seen that the difficulty of mathematics questions creates anxiety in students (Pura, 2020). For students to answer the math questions in LGS correctly, they need to have reading comprehension skills, basic mathematical knowledge and processing ability, analytical thinking skills, logical thinking and judgment ability, problem-solving competence and the ability of knowledge transfer (Şıvkın et al., 2020). It was revealed by Yaprakgül (2019) that PISA questions require intuitive thinking, learning through invention, and are prepared about daily life problems, taking into account social problems and needs. It can be said that preparing students for the exam by solving PISA-style questions has been effective in increasing Turkey's mathematical literacy from 48th to 42nd place according to PISA results.

42.89% of the students in 2018 and 40.28% in 2019 did not answer the math questions (Erden, 2020). As a solution to this situation, the exam duration of the numerical lessons section was increased from 60 minutes to 80 minutes in 2019. In addition to extending the exam period, it may be useful to consider other reasons for not answering the questions. According to Erden (2020), solving mathematics questions in LGS requires the use of course achievements and many other skills together. Moreover, some experts in educational sciences criticize the face and construct validity of the questions (Gültekin,

2018). For example, while Turkish lesson questions are associated with Math, Science and other lessons, Math questions are associated with Turkish lesson achievements. While 450 words were used for math questions in TEOG exams, an average of 1200 words were used for math questions in the 2019 LGS exam (Erden, 2020). In the study conducted by Göktaş (2010), it was concluded that reading comprehension skills affect success in mathematics lessons. It will be useful to gain a reading habit, solve questions about daily life problems, make up basic mathematics deficiencies, and prefer modern teaching methods to provide students with the basic competencies required to correctly answer the mathematical questions asked in LGS.

It would be appropriate to plan the changes to be made in the future as a result of long-term and, if possible, pilot studies, taking into account the positive and negative aspects of the previous systems, and to explain this planning in detail to all educators and parents. The outcomes of the system designed as a result of long-term plans based on secondary and higher education will serve as a guide in terms of shaping Turkey's education policies.

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