



EXAMINATION OF SYSTEM OF TRANSITION TO UPPER-SECONDARY SCHOOLS FROM LOWER-SECONDARY SCHOOLS IN TERMS OF STUDENT, CLASS, AND SCHOOL LEVEL VARIABLES

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Abstract

Central exams which are reflection of structure of education systems determine many schooling processes. Especially, scores coming from these exams are indicators for student performance. Transition to upper-secondary school from lower-secondary school is based on “System of Transition to Upper-Secondary Schools” (LGS). The current study aimed to examine the relationship between scores on System of Transition to High Schools (LGS) and student, classroom, and school level variables. The design of the study is a correlational research. The random sample consisted of 731 students from 47 classrooms in the 15 lower-secondary schools. Secondary data coming from educational institutions via school information form were analyzed by Hierarchical Linear Modelling (HLM). School success score as a student-level variable, experience of a class teacher as a classroom-level variable, and a number of exam branch teachers, and a number of teachers assigned in support and training courses as school-level variables predicted significantly students’ performance in LGS. Considering the results of the current study, activities for professional development of teachers is recommended urgently to increase performance of the students.

Keywords: *educational policy, HLM, student performance, teacher experience, transition to upper-secondary school*

Introduction

Educational policies of the countries determine their education systems such as that all school stakeholders take their positions by considering these systems. Attendance of the students, teaching activities of the teachers and parental involvement are shaped by the education system. National education system in Turkey depends on two unique characteristics: centralized structure and crowdedness of stakeholder. These realities find out some necessities to administer and govern education in Turkey. To name a few, national exams to select students, central procedures to assign teachers, and financial plans to build new schools are topics frequently discussed by public and political actors in Turkey. In these respects, the current study will evaluate national and central exam in student, classroom, and school levels so that it will both serve to fill a gap in the literature and make contribution to educational policies in Turkey.

Research Problem

Educational policy was led by Ministry of National Education (MoNE) in Turkey. “2023 Education Vision” which includes structural and procedural reforms in order to improve

education system of Turkey in different fields was implemented within the coordination of MONE and Presidency (MoNE, 2019a). One of the focal points of this reform attempts is to provide an efficient transition from lower-secondary schools to upper-secondary schools.

Turkey has been trying different systems of transition to upper-secondary schools for years. The system between 2000 and 2003 was named as Exam for Entrance to Upper-Secondary Schools (LGS). That system changed in 2004 and was entitled as Selection and Placement Exam for Secondary Education Institutions (OKS). When comes to 2008, name of new system became Placement Test (SBS) which was firstly administered to all students of 6th, 7th, and 8th grades. After 2009, only 8 students entered this exam. In 2014, system was again changed and was called as Transition from Primary Education to Secondary Education (TEOG) between 2014 and 2017 (Atılğan, 2018). Recently, System of Transition to Upper-Secondary Schools (LGS) has been implemented since 2018 and will happen for the fourth time in 2021 (MoNE, 2020a).

The newest system has brought together important changes. First of all, even if the students do not enter the exam, they will be placed in a high school by considering residential address and middle school performance. Further, the students participating in the exam were placed in the upper-secondary schools which are achievement-oriented schools and have limited quota so that academic achievement of the student in the exam will be determinant. To illustrate, 1029555 students participated in the exam and 138993 of them were placed in an upper-secondary school. Remaining ones were placed by considering residential address, school degree point, and attendance rates. On the other hand, questions in the exam are selected from branches of Mathematics, Turkish Language, Science, Foreign Language, Turkish Republic Revolution History and Kemalism, and Culture of Religion and Knowledge of Ethics (MoNE; 2019b). To summarize, systems of transition to high school changed many times in the last 20 years. It can be implied that there has been either unsteadiness or pursuit of better one.

Research Focus

Transition to upper-level schooling is the topic which has not lost its value for years due to centralized exams and young population. These exams occupy the agenda of the public and are studied by many researchers. Transition to upper-secondary school, transition to college, and transition to professional life are the most three popular systems including central exams. In 2020, 1.473.303 lower-secondary school students (MoNE, 2020b), 2.296.138 upper-secondary school students (Centre for Assessment, Selection, and Placement, 2020), and about 1.500.000 university students or graduates (Demir, 2020) were involved respectively in exams of transition to upper secondary school, transition to college, and transition to professional life.

Literature based on central exams may be classified into three groups. The first group is related to studies concentrating on relationship between exam scores and other educational variables. School culture (Yılmaz & Bülbül, 2017), social and psychological effects (Çetin & Ünsal, 2018), reading skills (Tuzlukaya, 2019), equality of opportunities (Sarier, 2010) are the topics linked to achievement in central exams, to name a few. In the second group, there are studies focusing on the opinions of stakeholders about the exams. Attitudes towards central exams (Buldur & Acar, 2019), economical burdens (Dinç et al., 2014), and system change recommendation based on inclusion of other proficiencies (Karataş & Güleş, 2013) can be shown as examples to studies viewing opinions of stakeholders. The third group of studies concentrates on principles of assessment and evaluation. Item analysis based on mathematical proficiency (Dönmez & Dede, 2020), knowledge levels of questions (Özden et al., 2014), and item bias analysis (Bakan-Kalaycıoğlu & Kelecioğlu, 2011) were the studies related to assessment and evaluation procedures.

System of Transition to High School is the first central exam which Turkish students face in the 8th grade in middle school. In addition to desire for enrolling in a high-quality school, first experiences on central exam make this period significant. Therefore, researchers have examined systems of transition to high schools for years. Because the most important output of these exams is student performance or academic achievement, literature focuses mostly on antecedents of achievement. Doğan (2015) examined TEOG score and school success and found a positive relationship between grade point average and TEOG performance. Further, individual features have an impact on success in central exams. Bal (2011) examined predictors of achievement in the Placement Test and found that individual characteristics including self-confidence, ambition, and attention and motivation predicted mostly success in Placement Test. Similarly, study by Deniz and Kelecioğlu (2005) showed a positive relationship between academic achievement in primary education and OKS scores.

In the literature of central exams, socio-economic and socio-cultural dynamics draw attention. Köse (2007) examined the relation between academic achievement in Exam for Entrance to High Schools and socioeconomic indicators and found that there was a relationship between academic achievement and socioeconomic indicators such as private courses. Similar study was conducted by Yavuz et al. (2016), who found that achievement was different by socioeconomic differences among the schools. Aslan (2017) conducted a study to find out determinants of student success in TEOG and found that educational levels of parents, house income, and annual education expenditure for child predicted TEOG score of the student. Metin (2013) examined factors affecting SBS and detected effects of grade level of students, education level of parents, and home income on SBS performance.

The other side of the literature was commonly based on views, expectations, and recommendations of school stakeholders. Akbaba-Altun and Çakan (2008) analyzed views of school principals of successful schools in terms of LGS success. The authors found that practice exams in the whole city, qualified educators, infrastructure, coordination among schools and private courses, supporting schools, and pre-schooling were important in increasing LGS success. The study by Şad and Şahiner (2016) focused on opinions of students, teachers, and parents about TEOG and showed that stronger sides of exam were right to enter exam in own school building, a make-up exam possibility, extending exam for two semesters, and not using correction-for-guessing formula whereas the criticized points were unsecure exam conditions, and promoting private course institutions and tutoring. A metaphor study was performed by Baş and Kılıncım (2019) to check perceptions of students about central exams like SBS and TEOG. The authors found metaphors which can be grouped as “concept as anxiety, torture, disturbing thing”, “concept as unfair, unnecessary race”, “concept as unconventional, irrelevant, variable, or always existing thing”, “concept as turning point of our lives”, “concept of selective and determinative of life”, and “concept as long or a short-term race”. Atılğan (2018) reviewed both national and international implementations on transitions among educational levels and recommended a model based on proficiency exam, combination of academic achievement, guidance, and proficiency exam score, threshold value for either technical high school or right to enter selection exam, and placement according to the achievement situation. To conclude, systems for transition to upper education level have both strong and weak sides so that researchers, scholars, educators, and policymakers have an intention to improve these systems.

Theoretical Framework

The theory of the current study was framed by Bronfenbrenner’s Bio-Ecological Theory. Bronfenbrenner (1977) explained the core idea behind theory as the child’s interaction with outside. According to the theory, student is placed in the center and this “outside” consisted of five layers: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Child’s

interaction with closer elements around it, interaction between closer elements around child, indirect environment around the child, social and cultural values, and changes over time were the conceptualization of each layer, respectively. Components constructing purpose of the study were sprinkled among these layers.

Research Aim and Research Questions

The latest system for transition to upper-secondary school in Turkey has been named as “System of Transition to Upper-Secondary Schools” (LGS). The current study has aimed to examine relation between scores on System of Transition to Upper-Secondary Schools (LGS) and student, classroom, and school level variables. The research question was as below:

How well do student-level (school success score and year-end success score), classroom-level (branch of class teacher and experience of class teacher), and school-level (number of exam branch teachers, number of teachers assigned in support and training courses, ratio of teacher to student, and non-attendance rate) variables predict LGS scores?

Research Methodology

General Background

The design of the current study was correlational research analyzing secondary data. A correlational study has a purpose to explore relations among variables (Gall, Gall, & Borg, 2013). In correlational studies, there are mainly two types of variables which are predictor and criterion variables. A predictor variable is the variable that is used to make a forecast about criterion or outcome variable while a criterion variable is the variable being predicted by a predictor variable (Creswell, 2012). Predictor variables were grouped as student-level (school success score and year-end success score), classroom-level (branch of class teacher and experience of class teacher), and school-level (number of exam branch teachers, number of teachers assigned in support and training courses, ratio of teacher to student, and non-attendance rate) variables. A criterion variable was the score coming from central LGS exam. The reasons why these variables were selected were related to nature of the current study and access to data. Nature of the current study is based on the dynamics of LGS such as that questions in LGS are asked by considering curriculum of six branches. Further, students are trained by Support and Training Courses. On the other side, data coming from schools and district national education directorate were limited to these variables.

Sample

Sample consisted of the 731 eighth-grade students in an Anatolian Province. Moreover, 47 classrooms and 15 middle schools were included in the analysis. Random sampling was used such as that 15 middle schools among totally 30 lower-secondary schools were selected randomly to generalize results for the whole province including 30 schools. All of the classes and students in these schools were used in the study. Two of these schools were private schools while there were 13 public schools. Branches of 47 eighth-grade teachers were distributed as Turkish ($n = 12$), Mathematics ($n = 9$), Life Science ($n = 8$), Social Science ($n = 8$), Foreign Language ($n = 6$), Sports ($n = 2$), Religious Science ($n = 2$), and Fine Arts ($n = 1$). Average experience of teachers was 13.25 while average class size was 26.06. Average of year-end success score, school success score, and LGS score of the students was respectively, 83.84/100, 84.22/100, and 312.59/500.

Instrument and Procedures

Secondary data were procured from schools and district national education directorate. In the current study, secondary data were requested via school information form. This form included statements related to students, classrooms, and schools. Considering students, year-end success score, school success score, and LGS score of the students were collected. Branches and experiences of the eighth-grade teachers were classroom-level variables. Lastly, school-level variables were the number of exam branch teachers, the number of teachers assigned in support and training courses, the ratio of the number of teachers to the number of students, and non-attendance rate. Table 1 depicts information about variables.

Table 1
Variables and Information about the Items

Variables	Item Type
Dependent variable	
LGS score	Ratio scale
The first-level: Student-level variables	
Year-end success score	Ratio scale
School success score	Ratio scale
The second-level: Classroom-level variables	
Branch of class teacher	Nominal
Experience of class teacher	Ratio scale
The third level: School-level variables	
Number of exam branch teacher	Ratio scale
Number of teachers assigned in DYK	Ratio scale
Rate of # of teacher to # of student	Ratio scale
Non-attendance rate	Ratio scale

Data Analysis

Secondary data were analyzed by Hierarchical Linear Modeling (HLM) such as that analysis was conducted in student, class, and school levels. HLM is a complex form of least squares method. In this method, independent variables are separated to levels hierarchically so that variations on dependent variables are calculated more accurate. The reason why HLM was used instead of Multiple Linear Regression was that student data were nested in both classes and schools. School, class, and student characteristics must be examined within HLM since education systems have a hierarchical structure. Further, HLM eliminates violation of assumption of independent observation for nested data. Assumptions of HLM which are linearity, normality, and homoscedasticity were checked and met. In the analysis, data collected via school information form was entered in SPSS file. HLM was constructed to reveal within-class, between-class / within school, and across-schools. In other words, data included three levels: student as level-1, classroom as level-2, and school as level-3. In the analysis, student version of HLM 8.0 was performed.

Research Results

Unconditional (Null) Model

In order to investigate how much variance in LGS score was caused by differentiation in student-level, class-level, and school-level factors, unconditional model was performed. The

model is significant ($t = 31.62, p < .001$) such as that usage of HLM instead of regression is significant as Table 2 demonstrates. In-class correlation coefficients (ICC) for student, class, and school were calculated respectively as .74, .08, and .18 such as that 74% of variance in LGS score was accounted for by student differences while 18% of variance in LGS score was accounted for by differences across schools. Differences in variance also showed that running HLM for this dataset was appropriate.

Table 2
Statistics about Null Model

	Coefficient	SE	t ratio	df
Intercept	304.70	9.63	31.62*	12

* $p < .001$

Level-1 Model (Student Level)

Level-1 model focusing on the effects of student variables on LGS performance revealed that in-group variance decreased to 811.72 from 3838 when student variables added to the model. Further, there was a decline in the amount of deviance from 7612.93 to 6554.92. Test of variance-covariance components in the level-1 model was significant, $X^2(12) = 240.63, p < .001$. All of these indicators showed that level-1 model was significant according to Garson (2013).

Table 3 summarizes statistics related to level-1 model. Only school success score predicted significantly LGS score. School success score was positively related to LGS score such as that one-unit increase in school success score would increase LGS score 5.44 points. However, year-end success score did not predict LGS score significantly.

Table 3
Level-1 Model

	Coefficient	SE	t ratio
Intercept	-184.20	11.83	-15.56*
Year-end success score	.47	.31	1.51
School success score	5.44	.33	16.39*

* $p < .001$

Level-2 Model (Classroom Level)

Level-2 model focusing on the effects of classroom variables on LGS performance depicted that in-group variance decreased to 8.15 from 403.90 due to addition of classroom variables into the model. Moreover, there was a decline in the amount of deviance from 7612.93 to 6547.74. Test of variance-covariance components in the level-2 model was significant, $X^2(12) = 398.45, p < .001$. All of these indicators showed that level-2 model was significant (Garson, 2013).

Table 4 presents statistics related to level-2 model. Only experience of class teacher predicted significantly LGS score. Teacher experience was positively related to LGS score such as that one-unit increase in experience of teacher would increase LGS score .89 points. On the other hand, a branch of teacher did not make a significant difference on LGS score.

Table 4
Level-2 Model

	Coefficient	SE	t ratio
Intercept	-191.91	11.92	-16.11*
Experience of class teacher	.89	.28	3.12**
Branch of class teacher	-.60	.66	-.91

* $p < .001$

** $p < .004$

Level-3 Model (School Level)

Level-3 model focusing on the effects of variables on LGS performance depicted that in-group variance decreased to 309.76 from 932.26 due to the addition of classroom variables into the model. Moreover, there was a decline in the amount of deviance from 7612.93 to 6540.53. Test of variance-covariance components in the level-3 model was significant, $\chi^2(8) = 183.26, p < .001$. All of these indicators showed the significance of level-3 model as Garson (2013) stated.

Table 5 offered statistics related to level-3 model. Number of exam branch teachers and number of teachers assigned in DYK predicted significantly LGS score. Number of exam branch teachers were positively related to LGS score such as that one-unit increase in the number of exam branch teachers would increase LGS score in 2.78 points. On the other side, number of teachers assigned in DYK was negatively related to LGS score. One-unit increase in the number of teachers assigned in DYK would cause 2.93 points decline in LGS score. Non-attendance rate and the rate of number of teachers to number of students did not explain a significant variance in LGS score.

Table 5
Level-3 Model

	Coefficient	SE	t ratio
Intercept	-228.08	25.42	-8.94*
Number of exam branch teacher	2.78	1.06	2.63**
Number of teachers assigned in DYK	-2.93	1.19	-2.46**
Non-attendance rate	6.86	3.16	2.18
Rate of # of teachers to # of students	.42	1.77	.24

* $p < .001$

** $p < .05$

Discussion

The current study examined relation between LGS performance and variables in the levels of student, classroom, and school. Most of the variance in LGS score was explained by differences in students. Further, the study showed that school success score as a student-level variable, experience of class teacher as a classroom-level variable, and the number of exam branch teachers and the number of teachers assigned in support and training courses as school-level variables predicted significantly LGS achievement.

To begin, student differences explained more variance in LGS score than both school and classroom differences did. This result remarks two important conclusions. The first one

is related to nature of the exam such as that the students who have a desire to be enrolled in quality schools may enter the exam whereas the students who consent to be enrolled in the school closest to home do not have to enter exam. Therefore, this situation may push student characteristics to forefront. The second one is based on methodological choice such as that schools were selected only from one district. Thus, equality of opportunities among schools or something else is not a concern for the context of the study. On the other hand, literature has studies showing large school differences (Aksu et al., 2017; Çelen et al., 2011, Mercik, 2015). However, the common characteristics of these research studies was studying samples from many kinds of schools. As a result, catching larger variations for school differences is quite normal in this type of studies.

The current study performed three-level analysis based on HLM. The first level model showed that one student-level variable predicted significantly LGS performance. Increase in school success score would increase LGS performance whereas year-end score did not make a significant difference on LGS performance. This differentiation remarks an important conclusion. Year-end score is success score got at the end of a year. For the current study, year-end score is the success score of the eighth grade. On the other hand, school success score is the average of success scores of all grades. To conclude, long-term success was found more dominant on LGS performance than short-term success. This finding is consistent with the idea in the literature. Karakoç and Köse (2018) analyzed the relation between academic achievement in courses and points of those courses in TEOG. The authors concluded that academic achievement was linked to TEOG performance. Similarly, study by Kömürçü (2018) showed that there was a positive relationship between high school success score and exam of entrance to higher education institutions (YGS). Kablan (2010) examined the relation between Grade Point Average (GPA) in Undergraduate and student performance on Civil Servant Selection Exam (KPSS) and found that GPA predicted KPSS performance. In summary, long-term academic achievement may determine performance in central exams.

The second level model showed that one classroom-level variable predicted significantly LGS performance. Increase in experience of class teachers would increase LGS performance while branch of the class teacher did not make a significant difference on LGS performance. Experience of teacher was studied by many scholars such as that academic achievement of students was linked to teacher experience. In this respect, results of the current study are consistent with the literature (Abazaoğlu & Taşar, 2016; Atar, 2014; Bhai & Horoi, 2019). On the other hand, a significant relation between branch of teacher and LGS performance was not detected although the researcher of the current study expected. The reason why the researcher had an expectation may be curiosity about the fact that the teacher whose branch is asked in the LGS exam might have a positive impact on students' preparation for the exam. However, the current study did not find a significant result so that the study was included in the literature which was not able to detect a significant difference on any educational variable for branch of teacher (Akçay & Pekel, 2017; Çam & Üstün, 2016; Şanlı, 2017).

Considering school-level variables, the third-level model depicted that number of exam branch teachers and number of teachers assigned in DYK as school-level variables predicted LGS performance. Increase in the number of exam branch teacher would increase LGS performance whereas increase in the number of teachers assigned in DYK would decrease LGS performance. This finding offers an interesting dilemma for the literature. How similar variables may form different results is remarkable. Primarily, literature has a common conclusion such as that increase in the number of teachers would increase positive school outcomes (Dinç et al., 2014; Doğan, 2004; Erdoğan et al., 2011; Pınar & Sarıbaş, 2009; Uzun & Çokluk-Bökeoğlu, 2019; Yıldırım, 2012). From this view, the current study is parallel to other studies in the literature. On the other hand, finding related to the number of teachers assigned in DYK is opposite to this common trend in the literature. The reason of this situation may be based on the

structure and process of DYK. In the literature, there are studies depicting problems observed in the DYK. Tiredness due to the course time at the end of the day (Timur et al., 2020), higher non-attendance rates (Bozbayındır & Kara, 2017), operation and planning problems (Canlı, 2019), and lower motivation of the students (Topçu & Ersoy, 2019) are the problems in DYK, to name a few. Further, Topçu and Ersoy (2019) emphasized that teachers gave lectures in DYK because of additional income and bonus service points. To summarize, problems observed in DYK and external motivators of teachers might have affected the results of this study.

Conclusions

The current study revealed out important conclusions on transition to upper-level schools from lower-level schools. Evaluation of educational systems for school transition may be done with multi-dimensional perspectives. In this respect, the current study performed the lenses of students, classes, and schools. However, studies in the literature focused on only one dimension of transition to upper-level schools. Thus, the current study showed a valuable attempt to close a gap in the literature. In transition to upper-secondary school from lower-secondary school in Turkey, perpetuity in school performance of students, experience of teachers, and a number of teachers determined academic achievement of the students in central exams. Further, the study underlined the importance of quality and content of the support rather than presence of support since additional courses provided by government may not increase academic achievement of the students. In spite of contribution of the current study to the literature, a remaining gap has been still waiting to be filled. Relation of socio-cultural background of the students with academic achievement is worth exploring.

Implications, Limitations, and Future Directions

Implications of the current study may be offered in terms of research, theory, and practice. Considering research, the researcher of the current study did not come up with a study investigating LGS that is a recent system on transition to high school in Turkey. Even though, there were descriptive reports of MoNE presenting results and a qualitative study based on the opinions of the teacher, literature lacking inferential study. Thus, the current study may be evaluated as an attempt to fill a gap in the literature. Further, multi-level analysis may make a contribution to the literature related to student performance. In terms of theory, findings of the current study may serve the ideas behind the layers of bio-ecological theory. Student performance is affected by both micro level factors and macro level factors. Considering micro level factors, teachers as elements of microsystem and mesosystems were found affective in student performance. In terms of macro level factors, centralized structure of LGS exam and DYK as a policy may be the actors of exosystem. To summarize, the current study may relate the perspective of the theory to the system on educational transition. Lastly, in practice, the current study may give an opportunity to policymakers, educational leaders, and practitioners to support students by enriching school settings. In this way, school effectiveness and school improvement may be offered for future.

The researcher conducted the current study by considering some limitations. Although the study had generalizability for population due to random sampling, the study was lack of ecological generalizability since data were limited to only one district. Also, data of the current study was collected via school information form. Analyses of the study were performed with secondary data. In other words, the study was limited to variables and accessible secondary data. Finally, the study had some delimitations such as that results of the current study were limited to 2019 LGS scores, students living in an Anatolian province, and perspectives of bio-ecological theory.

The researcher has recommendations in terms of research, theory, and practice. First of all, because the study is eventually based on secondary and quantitative data analysis, studies in the future could conduct empirical studies including both quantitative and qualitative primary or first-hand data from larger samples from different districts. Different variables for each level should be conducted in the future studies. To illustrate, students' psychological and emotional characteristics as student-level, class size and parent meetings as classroom-level, and school climate and school size as school-level could be included in the studies. In terms of theory, the current study was concentrated on the first three layers of the study. Therefore, future researchers may study macrosystem by integrating cultural issues. Further, the studies in the future may compare the results of exams in two or more different years so that there will be a link from student performance to the idea behind the chronosystem. Practical recommendations to practitioners, educational administrators, and policymakers are related to the improvement of school settings. Increasing student performance depends on thinking dynamics at each level. Sustaining academic achievement of students for all grades, increasing affectivity of parent-teacher associations, providing environments for professional development of teachers, assigning more experienced 8th grade teachers, adjusting policies for appointing more teachers at schools, and improving functionality of DYK through planning are recommended.

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