CULTURAL, ECONOMIC, AND EDUCATIONAL PREDICTORS OF SCHOOL EXIT EXAM SCORES IN AZERBAIJAN

G. A. Alasgarova

Pennsylvania State University, State College, USA.
E-mail: gunelalasgarova@gmail.com

Abstract. *Introduction.* The Ministry of Education (MOE) of the Azerbaijan Republic requires that students take an exit exam at the end of secondary schooling. The school exit exam (SEE) is administered to graduating students in 11th grade (i.e., high school equivalent) in three core subjects: (1) mathematics, (2) instructional language, and (3) foreign language. The State Examination Centre (SEC) has administered the SEE for over five years and recently changed the format, impacting university admissions (UA). In 2019, admission to a university was in two stages: (1) the SEE and (2) the university admissions exam. The current study used publicly available SEC data (*N* = 73) from Azerbaijan's 2019/2020 academic year by region.

Aim. The current research *aims* to examine the cultural, economic, and educational predictors of the school exit exam (SEE) in Azerbaijan's cities/regions according to the 2020 data. The article intends to demonstrate the relationship between economic, educational, and cultural precursors for successful versus unsuccessful SEE results.

Methodology and research methods. This correlational study used Multivariate (MANOVA) and Univariate (ANOVA) Analyses of Variance (RQ1) and Multiple Regressions (RQ2 and RQ3).

Results. For cultural predictors of the SEE, the Northern region had significantly higher Instructional Language (*p* = .010), English (*p* = .020), and Total scores (*p* = .010) compared to other regions. For economic indicators of the SEE, the average monthly salary was significantly predictive of Foreign Language (*p* = .035). For educational variables, the percentage of outstanding graduating students was predictive of all outcomes (*p* < .000 for all).

Scientific novelty and practical significance. Literature supports that the percentage of outstanding students and a family's annual income are strong positive predictors of SEE scores for all four D.V.s. Thus, this study claims that regions with exceptional academic performance and high family income tend to produce higher SEE scores. This substantive finding highlights the inter-rater reliability between the MOE and the SEC, as academic achievement is assessed by the MOE and the exit exam by the SEC.

Keywords: school exit exams, SEC, Azerbaijani cities/districts, math, instructional language, foreign language.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

103

КУЛЬТУРНО-ЭКОНОМИЧЕСКИЕ И ОБРАЗОВАТЕЛЬНЫЕ ПРЕДИКТОРЫ РЕЗУЛЬТАТОВ ШКОЛЬНЫХ ВЫПУСКНЫХ ЭКЗАМЕНОВ В АЗЕРБАЙДЖАНЕ

Г. А. Алескерова

Университет штата Пенсильвания, Стейт-Колледж, США.
E-mail: gunelalasgarova@gmail.com

Аннотация. *Введение.* Министерство образования Азербайджанской Республики требует, чтобы учащиеся сдавали выпускные экзамены по окончании средней школы. Выпускникам 11-х классов (т. е. в средней школе) нужно сдать выпускные экзамены по трем основным предметам: 1) математика, 2) язык обучения и 3) иностранный язык. Государственный экзаменационный центр (ГЭЦ) контролирует школьные выпускные экзамены в течение более чем пяти лет и недавно изменил формат, повлияв на прием в университеты. В 2019 году поступление в вуз шло в два этапа: 1) выпускной экзамен, 2) экзамен на поступление в вуз. В текущем исследовании использовались общедоступные данные ГЭЦ (*N* = 73) за 2019/2020 учебный год в Азербайджане по регионам.

Цель. Это исследование направлено на изучение культурных, экономических и образовательных предикторов школьных выпускных экзаменов в городах/регионах Азербайджана по данным 2020 года. Статья призвана продемонстрировать взаимосвязь между экономическими, образовательными и культурными предикторами успешных и неудачных результатов школьных выпускных экзаменов.

Методология и методы исследования. В этом корреляционном исследовании использовались многомерные (MANOVA) и одномерные (ANOVA) анализы дисперсии (RQ1) и множественных регрессий (RQ2 и RQ3).

Результаты. Для культурных предикторов школьных выпускных экзаменов в Северном регионе среди выпускников были значительно выше переменные «Язык обучения» (*p* = .010), «Английский язык» (*p* = .020) и «Общие баллы» (*p* = .010) по сравнению с другими регионами. Экономические предикторы включали вновь открытые рабочие места в 2019 году и среднемесячную зарплату. Среднемесячная зарплата родителей была существенно прогностической для иностранного языка (*p* = .035). Для образовательных переменных процент выпускников был предиктивным для всех результатов (*p* < 5000).

Научная новизна и практическая значимость. Проведенные исследования подтверждают, что процент выдающихся студентов и годовой доход являются сильными положительными предикторами баллов школьных выпускных экзаменов для всех четырех зависимых переменных. Таким образом, регионы с успеваемостью выше среднего уровня и высоким доходом семьи, как правило, дают более высокие баллы школьных выпускных экзаменов. Этот существенный вывод подчеркивает надежность совместного оценивания успеваемости, проводимого Министерством образования и ГЭЦ.

Ключевые слова: школьные выпускные экзамены, ГЭЦ, азербайджанские города/районы, математика, язык обучения, иностранный язык.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

104

Introduction

Throughout its 30 years of independence, Azerbaijan's education system has been "based on national and universal values and has a democratic character" [1, p. 2]. The Education Law of the Azerbaijan Republic defines the curricula execution term for different educational stages and levels based on state academic standards as General Education from I-XI grades [2]. Following General Education grades, "… students have to pass the final state attestation and then receive the Certificate of General Secondary Education" [3, p. 2].

As evidenced in the above laws, the Ministry of Education (MOE) of the Azerbaijan Republic is responsible for numerous educational policies, except for the school exit exam (SEE) and university admission exam, which are administered by the State Examination Center (SEC). Of utmost importance is the university admission exam, which is considered "…a fundamental and life-changing process in Azerbaijan culture and can involve almost 90% of secondary school graduates every year" [4, p. 257]. For instance, nearly 88% (N = 61,256) of the applicants in 2019 were graduates [5].

Admission to all 42 Azerbaijani universities goes through the SEC exams. In 2019, the SEC made fundamental changes to the admission exam format by adding the school exit exam to the university admission exam scores [6]. Some national educational experts [7] blamed the SEC for novel questions that do not match school resources and curricula. Others praised the change as another fair way to be admitted to a university [8].

It is widely accepted that "the best graduation results come from city schools and Turkish lyceums" [5, p. 394] and schools directly subordinated to the Ministry of Education of the Republic of Azerbaijan. However, many rural schools have recently presented high scores in different subjects. Last year, the SEC introduced statistical analysis and data related to the SEE and UA exam scores. Some cities and districts had excellent results; others displayed substandard performance. Interestingly, some cities and districts continuously produce high admission results, and some fail. For example, in 2020, the highest results were achieved by Ordubad district school graduates in the Azerbaijani section and Absheron district in the Russian section. School graduates of Sumgayit city and Gabala region succeed in the Azerbaijani language exam, Mingachevir city, Gabala region in literature, Sumgayit city, and Gakh region in mathematics. Matriculants of Neftchala region in chemistry, Absheron and Sheki regions in biology, Mingachevir city in history, Sumgayit city, and Gabala region in geography are among the highest performing areas in years. Unfortunately, more than 20% of entrants representing 2020 year's graduates of Tartar, Samukh, Dashkasan, Agdash, Agsu, Astara, Goygol districts, and Ganja city scored less

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

105

than 100 points in the entrance exams [5]. Why do school graduates of some cities and districts succeed in some/all exams, and some suffer setbacks? The main research objective of the current study was to examine different reasons for the variation in these scores on the SEE.

Literature Review

History of Exam

In Azerbaijan, the State Students Admission Committee (SSAC) was established in 1992 at the same time as the MOE to adopt a centralised university admissions-governing body "to counter corruption in higher education" [4, p. 255]. Since 1995, when the examination procedure was finalised, students graduating in 11th grade have been required to answer 120 multiple-choice questions from four different subjects in three hours to gain admission to universities. Admission was based on the score (0–700) without other considerations such as students' school grades, recommendations, international Olympiad achievements, Presidential scholarship grantees, etc. In 2012, the SSAC received the authority to implement a centralised graduation exam independent from the MOE. Later, in 2016, the SSAC became the State Examination Center (SEC) by the President of the Republic of Azerbaijan [9], with full power to implement multiple national and international exams.

In Azerbaijan, there are ten economic regions with 74 cities/districts. For more than 15 years, exams have been conducted in the capital city and at regional branches in Nakhchivan, Ganja, Shaki, Lankaran, Khachmaz, Goychay, Shirvan, Barda, and Shamkir, which has assisted in decentralising the administration of exams [5]. In this research work, 73 cities/districts will be recorded as there were no data related to Khankandi city under the Armenian occupation at that time.

Current Graduation and Admissions Exams

The Chairman of the SEC (M. Abbaszade) announced in September 2017 that the Board of Directors had decided to change the admission exam format beginning in April 2019. Since 2009, relying on the curriculum program (MOE, 2016), the committee has changed both the school exit and UA exams. As stated by the Chairman, these changes were related to form and content to highlight "an objective and transparent assessment of applicants' knowledge" [10, para. 27].

Overall, in 2019, there were multiple new changes to the exams, with one significant modification being the combination of graduation and university admission exam scores. Beginning in 2019, all graduates from comprehensive secondary education (XI grade) should first pass the instructional language

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

106

(Azerbaijani/Russian), math, and foreign language (i.e., either English, French, or German) exams with a score of at least 100 on each (i.e., 300 total) in the three-hour time frame (See Appendix A). The test item types have also been among the many changes to the exam, including multiple-choice items, open-ended or constructed-response items, situational judgment test items, and a listening passage in the foreign language component. The SEC recently stated that examinations would be held in remote rural schools and district city centers to ensure students' comfort. Specifically, the 11th-grade SEEs were organised in 242 examination centers [5]. In 2019, "applicants were allowed to take university admission exam two times to reduce the examination stress and give the applicants a second chance in case of any emergency" [5, p. 598].

There are special publications and books devoted to the Azerbaijan Education system in Azerbaijani, Turkish and Russian. There are also works about Azerbaijan's education policy [11, 12, 13], its development history [14, 15], applied projects, examination system [4], children with special needs [16], curriculum implementation [17], and reports of international organisations related to Azerbaijan's education system progress [1, 3, 17, 18]. However, there is limited research on the SEE, final admission scores, and postsecondary outcomes.

Although UA exams have been administered for over 25 years, there is limited research on the results from each city and district. Due to the literature being limited in scope, this study examined the impact of the SEEs on undergraduate and graduate admissions.

To summarise, countries have different SEE predictors; however, almost all countries have solely examined predictors of SEE success and failure without considering the larger regional contexts related to culture and the economy as two examples. Therefore, the regional, cultural, and economic predictors of SEE scores in Azerbaijan need to be investigated.

Purpose/ Statement of the Problem

School Exit Exams (SEEs) were designed to show that students who successfully passed the exams had developed the requisite undergraduate or workplace skills. However, there is no research on predictors of SEE performance and little research on the correlation between SEEs and UA, GPA, or success in the job market. Since 2019, the SEE and UA have been among the top discussed topics in the Azerbaijan education platform, albeit no detailed research has been done yet. Research to date has not defined nor examined the predictors of each core subject exam score from SEE for each district. This study's primary purpose is to determine what regional, cultural, economic, and educational predictors of SEE scores are related to math, instructional language, and foreign language

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

107

in Azerbaijan. During 2020/2021, only minor changes occurred in school graduation and university admission exams due to the pandemic. However, the most recent results are from 2019 (a pilot year for SEEs and UA combined results) and 2020 (COVID impacted exams). Therefore, this paper examines the link between the predictors and SEEs scores conducted by the SEC, mainly for 2019 and partially for 2020.

The SEC exams are one of very few "tickets" to undergraduate education in Azerbaijan, and every family, regardless of economic, educational, and cultural background, faces challenges regarding the SEE, UA, exam preparation, and university choice at some point. Some predictors have been discussed at times by the MOE, SEC, experts, school principals, and parents; however, some specific districts continue to present high graduation and admission results, while others continue to have poor outcomes.

For five years, the reforms implemented by the SEC have been widely discussed and mostly approved. Yet, little research has been done to examine the recent results and related outcomes. Findings from this study can be helpful for educational institutions of cities and districts, school principals, university administrators, parents, students, and others in the education system for further adaptations to the SEE, UA exams, student preparation, and university placement in Azerbaijani undergraduate programs. The findings may shed light on the impact of the SEC's rules, the work of the MOE, and the consequences stemming from new policies on students' lives and other directly related predictors by region in the country.

Significance of the Study

Firstly, this investigation is intended to examine the regional, cultural, economic, and educational predictors of school leaving exam scores from three core subjects. The centralised university admission exam results in Azerbaijan that were established for more than 25 years, combined with school exit exams in 2019, will be examined, emphasising the SEE predictors. It intends to demonstrate the relationship between economic, educational, and cultural precursors for successful versus unsuccessful SEE results.

Secondly, results will be a valuable source for future SEE applicants and university admission exam preparations and the future implementation of any adjustments by the MOE and the SEC. Findings may benefit future graduates, parents from specific cities and regions, and education employees in this sphere. They can use the experience of successful students from particular areas and further extend it in high schools/counties. No research has been done thus far that elaborates on the anticipated SEE results from all regions and obligations of regional institutions as well as the SEC.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

108

Furthermore, this study updates the scant literature by using a national cross-sectional study examining the SEC results in the 2020 year. Though the critical research question concerns the predictors of SEE results, this study can also be a base for investigating the impact of additional variables contributing to the SEE. For example, findings from this study can inform future research that is more specific to the individual student, including parents' educational background, race, ethnicity, school characteristics such as student funding, socioeconomic status, extracurricular activity involvement, etc.

Research Questions

The following research questions (R.Q.s) were examined: Are Azerbaijan's regional (RQ1) cultural, (RQ2) economic, and (RQ3) educational indicators significantly related to SEE scores? Specifically, this study sought to address the following R.Q.s:

Regional and Cultural:

RQ1: Are there differences in school exit exam scores between regions and cultures in Azerbaijan?

Economic:

RQ2: Do newly opened workplaces and average monthly salaries predict school exit exam scores in Azerbaijan?

Educational:

RQ3: Do universities/ vocational institutions and the percent of outstanding students predict school exit exam scores in Azerbaijan?

Methods

Operational Definitions

Independent Variables (I.V.s):

The following independent variables (I.V.s) were in each R.Q.: (RQ1) Cultural: Regions and Spoken Languages, (RQ2) Economic: New Businesses Opened in 2019 and Average Monthly Salary, and (RQ3) Educational: Universities/Vocational institutions in Region and Percent of Outstanding Graduating Students.

Regional and cultural I.V.s, such as regions and languages, were classified into discrete categories. There are 73 cities and districts in Azerbaijan in the summarised annual report for the academic year 2019–2020. All towns and districts were grouped into three geographical regions – North, Middle, and South. Languages were grouped into one or more than one languages as there are almost ten spoken languages among minorities across all Azerbaijani regions. Economic predictors included newly-opened workplaces in 2019 and average monthly salary.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

109

Educational predictors are universities/vocational institutions and percentages of outstanding students in each region. Outstanding students are school leavers with all excellent grades assigned by subject teachers. To avoid outliers, both IVs were coded from the interval scale into the ordinal scale. Table 1 shows some selected characteristics of the I.V.s.

Table 1

Descriptive statistics for the categorical independent variables (I.V.s; *N* = 73)

Variable	Category	n	%
Regions	South	25	34.2
	Middle	29	39.7
	North	19	26.0
Languages	Azerbaijani	58	79.5
	Azerbaijani + other(s)	15	20.5
Universities	0 universities	59	80.8
	>1 university	14	19.2
Vocational institutions	0 colleges	14	19.2
	>1 college	59	80.8

Dependent Variables (DVs)

The primary dependent variables (D.V.s) included the following SEE components: (1) mathematics, (2) instructional language, (3) foreign language, and the (4) total. The following four D.V.s are included in this study: (1) DV1: Total Score on SEE (graduation exam); 0–300 score (Interval scale), (2) DV2: Math Scores on SEE (graduation exam); 0–100 score (Interval scale), (3) DV3: Foreign Language Scores on SEE (graduation exam); 0–100 score (Interval scale), and (4) DV4: Instructional Language Scores on SEE (graduation exam); 0–100 score (Interval scale); Table 2 shows some selected characteristics of the D.V.s.

Table 2

Descriptive statistics for the dependent variables (DVs)

Variable	N	Mean	St. Deviation	Range	Skewness	Std. Error of Skewness
Total	73	102.52	14.89	76.21	.473	.281
Instructional language	73	42.85	5.83	29.27	.252	.281
Foreign language	73	29.78	5.59	26.31	.724	.281
Math	73	29.89	4.81	25.72	.567	.281

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

110

Research Design

Using existing data, a correlational research design examined relationships between the I.V.s and D.V.s. The current data from annual reports by the SEC and the State Statistical Committee from the committee's website were obtained for each city and district. Data collection and processing were analysed using Microsoft Excel and SPSS 27.

Population, Sample, and Participants:

Azerbaijan is administratively divided into 11 cities and 63 districts. There are ten economic regions: (1) Absheron, (2) Mountainous Shirvan, (3) Shaki-Zagatala, (4) Guba-Khachmaz, (5) Ganja-Qazakh, (6) Aran, (7) Upper Karabakh, (8) Kalbajar-Lachin, (9) Lankaran, (10) Nakhchivan. The first four regions were classified as Northern regions that have a border with Russia. The following two economic regions were ranked as the Middle/West regions. The last four regions were categorised as Southern and are bordered by Iran and Armenia.

Seven districts and a city out of 73 are located within the Nakhchivan Autonomous Republic (A.R.), which is included in the South regions. There are no data regarding Khankendi city (under Armenian occupation). The Upper Karabakh economic region consists of the districts of Tartar (partially), Agdam (partially), Khojaly (entirely), Khankendi (fully), Shusha (fully), Khojavend (fully), Jabrayil (entirely), and Fuzuli (fully), Kalbajar-Lachin economic region consists of Kalbajar (fully), Lachin (completely), Qubadli (fully) and Zangilan (fully) which were under Armenian occupation in 2019. There are no data for those regions collected by the SEC.

There are 42 universities, 61 colleges/vocational educational institutions, and 12 educational institutions across the country. Azerbaijan has one national language – Azerbaijani. Citizens also speak Russian, Georgian, and more than ten other minority languages. Information about newly opened workplaces and average monthly salaries was obtained from SSC annual report about each city and district [19, p. 22].

Finally, some data show that "110,938 examiners were 9th graders and 61,256 were 11th graders" [5, p. 602]. About 16% of students who completed high school in 2019 decided not to continue their education (67% were boys, 33% were girls). There is a total of 2077 graduates with outstanding results. "Only 37.06% of graduates with excellent grades could get top scores in UA exams" [5, p. 47].

Instrument/Materials:

The dataset was compiled from all cities and districts in Azerbaijan except for Khankendi. On April 7, 14, and 21, 2019, SEEs were held in almost all towns and districts in the country for 11th-grade students in secondary schools.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

111

The exam lasted three hours with 85 tasks from three core subjects. The SEC compiled a comprehensive database with results of trial exams, SEEs, and university undergraduate (Bachelor's) and graduate (Master's) admissions. The dataset in the current study also contained a record of student test scores for the UA by region, results from different profile subjects, and percentages of admissions with and without a scholarship, as examples of other variables.

Procedures/Data Analysis:

The main DV in this study measured how many average points students from 73 cities and districts obtained in math, foreign language, instructional language exams, and total. These D.V.s were measured on an interval scale from 0 to 100, whereby "0" represents the lowest number, and "100" means the highest gained from SEE in 2019. The total score was on an interval scale from 0 to 300. The independent variables were the regions, spoken languages, open workplaces, average salaries, number of universities/vocational institutions, and outstanding students in the study. They included continuous, ordinal, and categorical variables.

RQ1 (Are there school exit exam score differences between regions and cultures in Azerbaijan?) was analysed using 3 X 2 Factorial MANOVA and 3 X 2 Factorial ANOVA. Several statistical assumptions were examined before analysing the data. MANOVA assumptions are (1) independence of observations, (2) normality, and (3) homogeneity of variance. Box's equality test of covariance matrices was slightly violated (p = .041). The assumption of normality was tested via examination of the residuals by the Kolmogorov-Smirnov test. Normality was met for all groups (i.e., Azerbaijan p = .200, math p = .200, English p = .096). The bivariate correlation was analysed, and no variables were removed from the list. The assumption of homogeneity of variance was met for the school exit exam scores for all subjects [Azerbaijani Language, $F(4,68)$ = 1.937, p = .114; math, $F(4, 68)$ = 1.049, p = .389; and English, $F(4, 68)$ = 1.769, p = .145].

The factorial ANOVA also has several assumptions that need to be fulfilled – (1) normality, (2) homogeneity of variance, (3) and independence homoscedasticity. The assumption of normality was tested and met via examination of the residuals. A review of the overall Kolmogorov-Smirnov test for normality (p = .064) suggested that normality was a reasonable assumption. The histograms suggested that normality was reasonable, although the group plots reflected some non-normality. According to Levene's test, the homogeneity of variance assumption was satisfied [$F(4, 68)$ = 2.246, p = .073]. Scatterplots of residuals against the levels of the independent variables were reviewed. A random display of points around zero provided evidence that the assumption of independence was met without random assignment to groups.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

112

RQ2 (Do open workplaces and salaries predict school exit exam scores in Azerbaijan?) was analysed using Multiple Regression (one per DV), keeping potential covariates (Region and Languages Spoken). RQ3 (Do universities/ vocational institutions and the number of outstanding students predicts school exit exam scores in Azerbaijan?) was analysed also using Multiple Regression (one per DV), keeping potential covariates (Region, Languages Spoken, Open Workplaces, and Salaries). Multiple linear regression analysis makes several key assumptions: (1) linearity, (2) multivariate normality, (3) independence, and (4) no multicollinearity. A review of the partial scatterplot of the independent variables (Open Workplaces and Salaries, Universities/Vocational institutions, and Outstanding Students) and the dependent variable (total, math, English, and native language scores) indicates linearity is a reasonable assumption. Normality was also met through the Kolmogorov-Smirnov test. Also, the Q-Q plot and histogram suggested that normality was good. The assumption of independent errors has been completed as a relatively random display of points in the scatterplots was observed. The last assumption is a lack of multicollinearity in the predictors. "The test of multicollinearity ensures that none of the predictor variables are redundant or contain the same information about the dependent variable. When variables are redundant, there is a possibility that the size of the beta coefficients might be small" [20, p. 96]. The R-Squared is 0.62, which tells us that the open workplaces and salaries can explain the SEE scores, but only 62% of them. This indicates that the SEE score is not going to cause the problem.

Results

The results are presented for each of the three research questions. The paper concentrates on the central question of whether the regional, cultural, economic, and educational predictors can determine school exit exam scores in Azerbaijan.

Regional and Cultural

RQ1 (Are there exam score differences in math, English, and Azerbaijani between regions and cultures in Azerbaijan?) was analysed using 3 X 2 Factorial MANOVA. The null hypotheses tested include: (1) the mean school exit exam score in the Azerbaijani language was equal across all regions and languages; (2) the mean school exit exam score in math was equal across all regions and languages; and (3) the mean school exit exam score on English was equal across all regions and languages.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

113

First of all, Wilks' Lambda produced a statistically significant multivariate mean difference (as noted by p less than .α) only for the regions (.030) and region/ languages (.037) but not for languages (.247). The non-statistically significant main effect for the between-subjects factor suggests that there are differences, on average, in regions per two subjects (Azerbaijani and English). The non-statistically significant main effect for the between-subjects factor indicates that there are no differences, on average, in language per subject. The interaction for the between-within factor (i.e., regions by subjects) is most valuable in our findings. In examining confidence intervals of the interaction for the between-within factor, non-overlapping confidence intervals suggest statistically significant differences. We see that the patterns evident for the within-subjects factors echo here as well. Examining the statistically significant interaction using simple effects, we find that for Azerbaijani Language, there is a statistically significant difference between North and South as well as North and Middle (p = .010; p = .004). There is a statistically significant difference between North and Middle (p = .018) for math scores. The English score shows a statistically significant difference between North and Middle (p = .020). Overall, the SPSS table shows that North region students have better school exit exam scores in all primary subjects.

RQ1 (Are there school leaving total exam score differences between regions and cultures in Azerbaijan?) was analysed using 3 X 2 Factorial ANOVA. The interaction of type of region/languages and language are not statistically significant ($F_{\text{region x language}}$ = 2.258, df = 1,68, p = .138), and ($F_{\text{languages}}$ = 1.833, df = 1,68, p = .189). However, there are statistically significant main effects for the region (F_{region} = 4.883, df = 2,68, p = .010) and selection status Effect Sizes are small for the type of region status (partial η_{sport}^2 = .126). Partial eta squared for the main effect for type of region tells us that the proportion of variation in total score explained by the type of region in which the students participate that is not explained by selection status is about 13%. Observed power for region status is high (i.e., .787).

Post hoc analyses were conducted given the statistically significant omnibus ANOVA F tests for the main effects. Tukey's HSD tests were conducted on all possible pairwise contrasts. For the main effect of type of region, Tukey's HSD post hoc comparisons revealed that students in "north" regions had statistically significantly higher total school exit exam scores than all the other types of regions. More specifically, the following pairs of types of regions were found to be significantly different (p < .05): • North (M = 109.431, SD = 17.125) • North and South (M = 103.060, SD = 13.712); and • North and Middle (M = 97.518, SD = 12.712). In other words, students who lived in the "north" region had statistically significantly higher school exit exam scores than those who lived in any of the two other regions (i.e., south and middle).

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

114

Economic

RQ2 (Do newly open workplaces and salaries predict school exit exam scores in Azerbaijan?) was analysed using Multiple Regression (one per DV), keeping potential covariates (Region and Languages Spoken). Based on the results of the multiple regression analysis, the model was statistically significant in predicting the foreign language (English) exam from the average salary and salary/workplace (F [6, 41] = 2,533, p = .035) and (F [19, 41] = 2.066, p = .026) respectively. Therefore, we can conclude that the results of the multiple linear regression suggest that a significant proportion of only foreign language exam scores was predicted by salary and salary/workplace. Other predictors were not statistically significantly different from zero. We can state that students score higher in the English exam if their parents' wages are higher in their regions.

Educational

RQ3 (Do universities/vocational institutions and the number of outstanding students predict school exit exam scores in Azerbaijan?) was analysed also using Multiple Regression (one per DV), keeping potential covariates (Region, Languages Spoken, Open Workplaces, and Salaries).

Based on the multiple regression analysis results, the regression model was statistically significant between total exam mean score and university/institution and outstanding students, R^2 = .60, adjusted R^2 = .55, F (8,64) = 11.99, p = .000 level. The p-value for outstanding students' percentage (p = .000) indicates that the slope is statistically significantly different from zero.

Based on the multiple analysis results, the regression model was statistically significant between native language exam mean score and outstanding students, R^2 = .48, adjusted R^2 = .41, F (8,64) = 7.23, p = .000 level. Based on the multiple regression analysis results, the regression model was statistically significant between math exam mean score and outstanding students, R^2 = .50, adjusted R^2 = .43, F (8,64) = 7.88, p = .000 level. Based on the multiple analysis results, the regression model was statistically significant between foreign language (English) exam mean score and outstanding students, R^2 = .63, adjusted R^2 = .59, F (8.64) = 13.86, p = .000 level. The p-value for the intercept (p = .000) is statistically significantly different from zero as well as p-value for salary (p = .021), and outstanding students' percentage (p = .000) indicates that the slope is statistically significantly different from zero. In sum, the results of the multiple linear regression suggest that a significant proportion of all dependent variables was predicted by the percentage of outstanding students in the regions. Students tend to score higher in all school exit exam subjects if more outstanding graduates are in their areas.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

115

Discussion

This study aimed to examine the type of predictors that can affect the SEE scores all over Azerbaijan according to the 2020 data. SEE is defined as exams from math, foreign language, and instructional language by SEC for all 11th-grade students in Azerbaijan. The population under study included a weighted total of 61.256 students who were high school graduates from 73 cities and districts in 2019. The input and several variables were selected from the review of the annual reports and included in the study to determine which variables predicted SEE. Three input blocks consisted of: (a) regional and cultural (two variables), (b) economic (two variables), and (c) educational (three variables). Multiple regression and factorial ANOVA/MANOVA were used to analyse the data. All assumptions were tested and almost met.

The analysis was conducted successfully using secondary data analysis, and several significant results were achieved. Through research, it was found that not almost all predictors (economic, educational, regional, and cultural) are essential, but some separate predictors are much stronger precursors to future SEE results. Of the seven variables that emerged as significant predictors in the model, three variables were positive predictors of some SEE results. These variables were associated with regions, salary, and percentage of outstanding students.

The first research question asked what are, if any, school exit exam score differences between regions and cultures in Azerbaijan. The region is one predictor that emerged as significant and positively correlated with SEE results. It is plausible to think that students who live in the North of Azerbaijan and the border with Russia have high SEE results (especially in English and Azerbaijani). First, it can be because of the prosperity and stability of northern regions since independence. Also, northern regions (Absheron, Mountainous Shirvan, Shaki-Zagatala, Guba-Khachmaz) are much more integrated, modern, and economically stable, leading to a greater interest in languages among school students. "Azerbaijan's most important railway, road, water, and airlines pass through these regions" [21, para. 2]. Northern regions are favorable for touristic attractions as they are "between mountains and the sea" [22, para. 5]. Also, Absheron and the capital city Baku were among the northern cities, advancing their development prospects. Finally, there can be several unpredictable reasons, and the study's finding needs to be elaborated on in future research works.

Question two – Do open workplaces and salaries predict school exit exam scores in Azerbaijan? One predictor emerged as a positive significance in block two of the research model. Consistent with this study, the average monthly salary has been noted as the most significant predictor of Foreign Language exams in the SEE. "Researchers have repeatedly found that wealthy students

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

116

enjoy significant advantages throughout the college application process and that income greatly impacts a student's performance on standardised tests" [23, para. 5]. Thus, it is not surprising that parents with a higher average income tended to provide opportunities for their children to be enrolled in the expensive language course preparations for SEE and UA. Further research can determine why the math exam was not among those results.

Block three – Educational characteristics: The third research question asked whether universities/vocational institutions and the percentage of outstanding students predict school exit exam scores in Azerbaijan. First, it was somewhat surprising that the number of universities/vocational institutions were not correlated with SEE results. More research is warranted in this area. Second, the literature supports that the percentage of outstanding students is a strong positive predictor of exam scores. Worldwide research shows that high school students' grades correlate with their admission scores and, later, their university/college GPAs [24, 25, 26]. The prior research supports previous findings that the percentage of outstanding students is a strong positive predictor of SEE results from all four dependent variables. Thus, this research concludes that regions with exceptional school grades tend to produce high SEE scores.

The research question addressed in this section is the crux of the study. Since grading is done by school teachers (MOE) and SEE is done by SEC, there appears to be a correlation between the two evaluations. An example is Nakhchivan city, with .05% outstanding students and an average of 124.02 points, or Ganja, with .04% of exceptional students with 115.02 points from SEE. In 2019, SEC [5, p. 42] investigated that "37.06% of graduates with excellent grades could prove their results in the UA exam," which is low. However, our findings show that the joint assessment, evaluation, and collaboration of SEC and MOE could positively correlate, even if it is in the high school format (school grades vs. SEE).

The statistical analysis supports that the percentage of outstanding students is a strong positive predictor of SEE scores for all four D.V.s. Thus, this study claims that regions with outstanding school graduation grades tend to produce higher SEE scores. This substantive finding highlights the inter-rater reliability between the MOE and the SEC, as academic achievement is assessed by the MOE and the exit exam by the SEC. This study also highlights the impact of regional culture and economics on exit exam scores, with northern residential locations and average income predicting higher scores on exit exam components.

However, there were limited studies on the predictors of SEE. This particular study varies from previous studies focusing on the different predictors of SEEs all over Azerbaijan. Also, the study utilises a more recent dataset-school

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

117

exit exam results of 2020, whereas prior research studies used data from SSAC.

Finally, the analysis of the exam scores from different country regions shows that the subjects' highest results belong mainly to the lyceums and private lyceums directly subordinated to the Ministry of Education. It is clear from the analysis that the exam results of rural areas in many subjects are ahead of Baku and Sumgayit. Such districts are Gadabay, Masalli, Gabala, Guba, Agstafa, Balakan, Imishli, Ismayilli, Gazakh, and Tovuz [5]. One of the objective reasons for this is that only prepared school graduates of these cities participate in the SEE and UA exams. As a consequence, most can succeed. Therefore, it would not be objective to compare the results of graduates by admitted percentage. However, these results are from the practical hard work of educational institutions and schools of the abovementioned cities and regions. It is appropriate to disseminate their work experience throughout the country. The education system of the republic as a whole can benefit from prosperous regions' experience.

Implications

This study was designed to examine SEE predictors for the 2019–2020 academic year. The study's findings illustrate how the specific predictors can impact SEE, thus providing a structure for increasing students' success as they matriculate through high school. Three variables were associated with SEE results that yielded surprising results: regions, salary, and percentage of outstanding students.

Firstly, students from northern cities and districts were more likely to be successful in instructional language, English, and total scores. That is most likely, half of the southern regions were bordered by Iran, which is highly conservative, and half districts were under Armenian occupation by that time. However, Nakhichevan AR (included in the south region) has separate high SEE results. Though these are plausible explanations for the finding, further research is warranted. We can also say that educational reforms carried out jointly with the World Bank is giving their results.

Secondly, as it appeared, parents with high salaries can play a vital role in SEE English results. The findings suggest that a high wage positively correlates with high SEE foreign language results, which is almost natural worldwide. Thirdly, our research findings also show that percentage of outstanding students and SEE results have high correlations, which can predict that soon both SEC and MOE assessments can be combined for the UA

The findings of this study provide helpful information for parents, educators, and administrators to assist students in becoming ready for SEE and

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

118

UA exams. The data is also beneficial for students who want to complete high school, get top scores from SEE, and gain UA with a scholarship. Finally, the information is essential for guiding educational policymakers to make decisions regarding SEE and UA that have a more significant role and influence on almost all Azerbaijani teenagers' lives.

Recommendations

As a result of the findings from this study, various recommendations are made to increase the high SEE scores of students before they enter the UA exam. Future research works can focus on a more complex model of student success; it should also include socio-demographic factors, number of attempts on exams, correlation of SEE and UA subject exam scores, and final exam results. The high school curriculum needs to be adjusted to incorporate the SEE programs. Educational policymakers from SEC and MOE need to decide if the tests measure high school curriculum or university admission readiness. If students pass the SEE tests without making academic aims, policymakers need to question the purpose of the exam style, topics, and resources spent on the tests.

We must mention that the SEC has had several changes in how students are evaluated for the last five years. Even in 2020, because of COVID-19, there were adjustments in SEE and UA. It is predicted that in 2022 admission, again, some minor changes will be announced. Therefore, any new graduation assessment needs to be discussed with the core standards many years prior, or there will not be a connection between high school and undergraduate admission. Having inconsistent policies and procedures at graduation and entrance makes it hard to track success and achievements quite reasonably. There needs to be enough time for students, educators, and parents to learn the new standards.

To conclude, the current study used multiple regressions and factorial ANOVA/MANOVA as the statistical test with exam scores as the dependent variable. Future research can be conducted with different dependent variables like GPA, university admission percentage, or presidential/Olympiad scholarship.

Limitations

As this study will be the first to use data with new admission rules on a large scale, there are some limitations. First, the results will be limited as only secondary data from SEC, SSC, and MOE were processed. In further research, data should be collected from different sources as well. Due to various internal validity threats such as historical events (e.g., hostilities on the country's borders

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

119

in 2020, Coronavirus-online learning), this study is limited to data analysis. However, future research may consider implementing other methods, such as a quasi-experimental design, surveys, and interviews involving parents, tutors, and students from different cities and districts.

Two thousand nineteen school exit exam results are not entirely valid as the first year was a pilot year, and 2020 was affected by COVID restrictions. Still, SEEs were implemented successfully (even with some delays), and successful students got admission to various universities. It is essential to mention that the data can have some misconceptions as the sources and reports were different and often competing interests involved. The researcher needs to rely on the given data since there are no opportunities to double-collect, check, and compare the results directly.

Research on this topic is pretty new; thus, there is a need for additional research and evaluation of identified measures. Information about the graduates from the occupied regions (ten) needs to be detailly clarified. The data represent a national sample; only one cohort of students who graduated in 2020 was captured. Therefore, the study findings are not generalisable to other groups or years.

Conclusion

This study investigated the educational, economic, regional, and cultural predictors of high school exit exams in 2019. Prior studies have focused on the impact of SEC undergraduate and graduate admission exams, the correlation between SAT and SEC exam scores, and the linkage with the first-year GPA. This study is the only one that used the SEE results of the most recent nationally representative cohort of students and examined whether there are any predictors for school exit exams.

The results of this study contribute to the literature by identifying which predictors or potential covariates influence instructional language, math, foreign language, and a total of three core subject exams. The study suggests that high school students from northern cities/districts bordered by Russia tend to have high results from languages; as a part of economic predictor-salaries predict high SEE scores from the foreign language.

This study identified implications that empower students to pass SEE successfully. Also, the research provided recommendations for cities/districts' institutions, parents, educators, and administrators to construct environments that foster SEE readiness. Lastly, various suggestions were offered to policymakers to consider when and how to implement a SEE policy.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

120

References

1. UNESCO. World data on education: Azerbaijan [Internet]. 2011 Aug [cited 2022 Apr 25]. 7th edition. Available from: http://www.ibe.unesco.org/fileadmin/user_upload/Publications/WDE/2010/pdf-versions/Azerbaijan.pdf

2. MOE. Execution term for educational programs (curriculums) [Internet]. 2010 [cited 2022 Apr 25]. Available from: https://edu.gov.az/en/page/303/2182

3. PIRLS Encyclopedia. Azerbaijan [Internet]. 2016 [cited 2022 Apr 25]. Available from: file:///C:/Users/ralas/Desktop/65515%20Quant/7%20articles/azer/Azerbaijan.pdf

4. Kazimzade E., Silova I. External examination system in Azerbaijan. Secondary school external examination systems: Reliability, robustness, and resilience. Amherst, NY: Cambria Press; 2009. p. 253–264.

5. SEC. Scientific-statistical analysis of the final exam results on students' admission to higher and secondary outstanding educational institutions of the Republic of Azerbaijan and public education institutions for the 2019–2020 academic year. Annual Report [Internet]. 2020 [cited 2022 Apr 25]. Available from: http://dim.gov.az/activities/research/statistika/

6. SEC. A new model of school graduation and university entrance exams to be applied in 2019 [Internet]. 2019 [cited 2022 Apr 25]. Available from: http://dim.gov.az/en/news/2576/?sphrase_id=782065

7. Reyting. Ali məktəblərə qəbul imtahanlarının yeni qaydaları narazılıq yaradıb [Internet]. 2018 Oct 14 [cited 2022 Apr 25]. Available from: https://reyting.az/arasdirma/10337-ali-mekteblere-qebul-imtahanlarinin-yeni-qaydalari-narazliq-yaradib.html (In Azerbaijani)

8. BBC News Azerbaijan. Ali məktəblərə yeni qəbul qaydaları: Gələn il abituriyentləri hansı yeniliklər gözləyir? [Internet]. 2018 Dec 24 [cited 2022 Apr 25]. Available from: https://www.bbc.com/azeri/azerbaijan-46646454 (In Azerbaijani)

9. President of the Republic of Azerbaijan Ilham Aliyev. Decree of the Republic of Azerbaijan's President on establishing the State Examination Center of the Republic of Azerbaijan as a public legal entity [Internet]. 2016 Apr 11 [cited 2022 Apr 25]. Available from: https://president.az/articles/19240

10. Modern. Məleykə Abbaszadədən buraxılış və qəbul imtahanlarının yeni modeli ilə bağlı müraciət [Internet]. 2018 Oct 13 [cited 2022 Apr 25]. Available from: https://modern.az/az/news/180228/meleyke-abbaszadedenburaxilis-ve-qebul-imtahanlarinin-yeni-modeli-ile-bagli-muraciet- (In Azerbaijani)

11. Ahmadov H. The strategy of education development in Azerbaijan. Saarbrucken, Baku: Lambert Academic Publishing; 2014. 256 p.

12. Huseynov V. Azerbaijan. In: C. L. Glenn, J. De Groof (Eds.). Balancing freedom, autonomy, and accountability in education. Vol. 4 (7–21). Tilburg, NL: Wolf Legal Publishers; 2012. 312 p.

13. Mammadov R., Abasli K. Teachers' views on the problems of Azerbaijan education system after independence. Doğu Anadolu Sosyal Bilimlerde Eğilimler Dergisi. 2019; 3 (2): 43–59.

14. Mahmouds K. F. Peculiarities of the development of education in Azerbaijan in the 50–60s of the XX century. *Uchenye zapiski Orlovskogo gosudarstvennogo universiteta = Scientific Notes of Orel State University*. 2013; 55 (5): 20–24. (In Russ.)

15. Mardanov M. Azerbaijani education looks at the recent past, present, and future. *525 Newspaper*. 2010 May 28. p. 10–11.

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

121

16. Mikayilova U. Inclusive education reform/s in Azerbaijan: An attempt at critical policy analysis. *Azerbaijan Journal of Educational Studies.* 2019; 3: 37–48.

17. Karimova Y., Kazimzade E., Silova I. Azerbaijan: The role of teachers in curriculum reform. In: N. Ivanenko (Ed.). Education in Eastern Europe and Eurasia (Education around the World). London: Bloomsbury Academic; 2014. p. 259–276. DOI: 10.5040/9781472593474. ch-013

18. World Bank Group Azerbaijan Partnership Program Snapshot [Internet]. 2016 Apr [cited 2022 Apr 25]. Available from: https://www.worldbank.org/content/dam/Worldbank/document/Azerbaijan-Snapshot.pdf

19. SSC. The State Statistical Committee of the Republic of Azerbaijan. Regions [Internet]. 2020 [cited 2022 Apr 25]. Available from: https://stat.gov.az/source/regions/?lang=en

20. Eafford R. F. The impact of high school exit exams and other predictors on college readiness: A national study [dissertation]. The University of Toledo; 2015 Dec. 207 p.

21. Azerbaijans. Bölgələr haqqında [Internet]. 2021 [cited 2022 Apr 25]. Available from: https://www.azerbaijans.com/content_434_az.html (In Azerbaijani)

22. Travel Agency. Şimal Bölgəsi [Internet]. 2021 [cited 2022 Apr 25]. Available from: https://ritm.tourismboard.az/idea-banki/simal-bolgesi (In Azerbaijani)

23. Hess A. J. Rich students get better SAT scores—here's why [Internet]. 2019 [cited 2022 Apr 25]. Available from: https://www.cnbc.com/2019/10/03/rich-students-get-better-sat-scores-heres-why.html

24. Khavenson T., Solovyova A. Relationship between the Unified State Exam and higher Education performance. *Educational Studies.* 2014; 1: 176–199.

25. Saprykina T. A. The transition "school – university": Predictors of academic performance of first-year students. *Vysshee obrazovanie v Rossii = Higher Education in Russia.* 2017; 213 (6): 76–87. (In Russ.)

26. American Institute for Research. Predictors of Postsecondary Success [Internet]. The College and Career Readiness and Success Center; 2013 [cited 2022 Apr 25]. Available from: file:///C:/Users/ralas/Desktop/Research%20in%20Evaluation/CCRS%20Center_Predictors%20of%20Postsecondary%20Success_final_0.pdf

Information about the author:
Gunel Akif Alasgarova – PhD Candidate (Educational Leadership), M. Ed. (Research, Measurement, and Statistics), Cand. Sci. (Educational Leadership); ORCID 0000-0003-4743-8467; Pennsylvania State University, State College, USA. E-mail: gunelalasgarova@gmail.com

Conflict of interest statement. The author declares that there is no conflict of interest.

Информация об авторе:
Алескерова Гюнель Акиф – аспирант (менеджмент в образовании), магистр наук (исследования, измерения и статистика), кандидат наук (менеджмент в образовании); ORCID 0000-0003-4743-8467; Университет штата Пенсильвания, Стейт-Колледж, США. E-mail: gunelalasgarova@gmail.com

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

122

Информация о конфликте интересов. Автор заявляет об отсутствии конфликта интересов.

Статья поступила в редакцию 09.05.2022; поступила после рецензирования 03.10.2022; принята к публикации 09.11.2022.

Автор прочитал и одобрил окончательный вариант рукописи.

APPENDIX A

School leaving exam (Grade XI); The exam consists of 1 stage only (duration – 3 hours).

	Subject	Max score	# of assignments
1.	Instructional Languages (Azerbaijani, Russian)	100	2 texts (artistic, publicist) on reading comprehension 10 assignments per text (5 closed-ended + 5 open-ended questions, which require writing) 10 closed-ended questions on language knowledge Total: 30
2.	Mathematics	100	7 open-ended questions, which require written solution + 5 traditional open-ended questions + 13 closed-ended questions) Total: 25
3.	Foreign Languages (English, German, French, Russian, Arabic, Persian)	100	6 listening (publicists or dialogue) assignments (3 closed-ended and 3 open-ended questions, which require writing) 8 reading comprehension (publicists or artistic) assignments (4 closed-ended and 4 open-ended questions, which require writing) 16 closed-ended questions on language knowledge Total: 30

Maximum Score: 300

Образование и наука. Том 24, № 10. 2022 / The Education and Science Journal. Vol. 24, № 10. 2022

123