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The Impact of State Expenditure on Education and on Student Academic Achievement

Zhassulan T. Kushebayev^{1*}, Galym S. Nygymetov²

¹ *Kenzhegali Sagadiyev University of International Business, 8a Abay Ave., 050010, Almaty, Kazakhstan*

² *M. Narikbayev KAZGUU University, Korgalzhyn highway 8, 010000, Astana, Kazakhstan*

Abstract

Due to the impact of quarantine measures against COVID-19, the quality of education in the country's schools has decreased. This issue is relevant and is on the agenda from the administration of the Head of State to university rectors and teachers, school principals and educators, students and their parents. Most of the participants in the discussion believe that too little money is allocated to the school. This article examines the impact of government spending on education and on students' academic achievements. According to the literature review, it was revealed that an increase in financial support for secondary schools from the state will lead to an increase in the quality of education. To solve these research questions, we used a correlation analysis between student academic performance and government spending, and household spending. On the basis of the selected variables, a correlation analysis was carried out by the method of rank correlation of the relationship between student performance and the amount of state funding for education. The study concluded that the success of students in education is influenced by non-financial factors, such as educational standards and appropriate teaching methods. At the same time, a paradoxical situation has been revealed, almost every year the government increases annual spending on education in secondary schools, but student academic performance is constantly falling. In addition, there was no strong statistical relationship between student performance and the amount of State funding for education. Therefore, the question arises about the effectiveness of the use of allocated public funds for education.

Keywords: State Expenditure, Student Achievement, Education, Finance, Human Capital, Economic Development

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* **Corresponding author: Kushebayev T. Zh.** – master of science, lecturer of the department Tourism and Hospitality, Kenzhegali Sagadiyev University of International Business, Almaty, Kazakhstan, e-mail: kushebayev@gmail.com

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Мемлекеттік білім беру шығындарының оқушылардың академиялық жетістіктеріне әсері

Кушебаев Ж. Т.^{1*}, Нығыметов Ғ.С.²

¹ К. Сағадиев атындағы Халықаралық бизнес университеті, Абай 8а, 050010, Алматы, Қазақстан

² М.С. Нәрікбаев атындағы КАЗГЮУ университеті, Қорғалжын тас жол 8, 010000, Астана, Қазақстан

Түйін

COVID-19-ға қарсы карантиндік шаралардың әсерінен ел мектептеріндегі білім сапасы төмендеді. Жалпы бұл мәселе бүгінде өзекті болып табылады және Мемлекет басшысының әкімшілігінен бастап университет ректорлары мен мұғалімдерінің, мектеп директорлары мен тәрбиешілерінің, оқушылар мен ата-аналарының да күн тәртібінде тұр. Осы талқылауға қатысушылардың көпшілігі мектепке тым аз ақша бөлініп жатыр деп санайды. Бұл мақалада мемлекеттік шығындардың білім беруге және оқушылардың академиялық жетістіктеріне әсері зерттелген. Жүргізілген әдеби шолуға сәйкес мемлекет тарапынан орта мектептерді қаржылай қолдаудың артуы білім беру сапасын арттыруға әкелетіні анықталды. Аталған зерттеу мәселелерін шешу үшін біз студенттердің үлгерімі мен мемлекеттік шығындар мен үй шығындары арасындағы корреляциялық талдауды қолдандық. Таңдалған айнымалылар негізінде оқушылардың үлгерімі мен мемлекеттік қаржыландыру көлемі арасындағы байланысты дәрежелік корреляциялау әдісімен талдау жүргіздік. Зерттеу нәтижесі студенттердің білім берудегі жетістігіне білім беру стандарттары мен сәйкес оқыту әдістері сияқты қаржылық емес факторлар әсер етеді деген қорытындыға әкелді. Сонымен қатар, парадоксалды жағдай анықталды, жыл сайын Үкімет орта мектептерде білім алуға жыл сайынғы шығындарды көбейтеді, бірақ оқушылардың үлгерімі үнемі төменепотырған. Сонымен қатар, оқушылардың үлгерімі мен білім беруді мемлекеттік қаржыландыру көлемі арасында күшті статистикалық байланыс анықталған жоқ. Сондықтан білім беруге бөлінген мемлекеттік қаражатты пайдаланудың тиімділігі туралы мәселе туындады.

Түйін сөздер: мемлекет шығындары, оқушының жетістігі, білім беру, қаржы, адами капитал, экономикалық даму

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* **Хат-хабаршы авторы:** Кушебаев Ж.Т. – ғылым магистрі, Туризм және қонақжайлылық кафедрасының оқытушысы, Кенжеғали Сағадиев атындағы Халықаралық бизнес университеті, Алматы, Қазақстан, e-mail: kushebayev@gmail.com

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Влияние государственных расходов на образование и на академические достижения учащихся

Кушебаев Ж.Т.^{1*}, Ныгыметов Г.С.²

¹ Университет международного бизнеса им. К.Сагадиева, пр. Абая, 8А, 50010, Алматы, Казахстан

² Университета КАЗГЮУ им. М.С. Нарикбаева, Коргалжинское шоссе 8, 010000, Астана, Казахстан

Аннотация

Из-за воздействия карантинных мер против COVID-19 качество образования в школах страны снизилось. Данный вопрос является актуальным и стоит на повестке дня от администрации Главы государства до ректоров университетов и учителей, директоров школ и воспитателей, студентов и их родителей. Большинство участников обсуждения считают, что школе выделяется слишком мало денег. В данной статье исследуется влияние государственных расходов на образование и на академические достижения учащихся. Согласно проведенному литературному обзору было выявлено, что увеличение финансовой поддержки средних школ со стороны государства приведет к повышению качества образования. Для решения данных исследовательских вопросов нами был использован корреляционный анализ между успеваемостью студентов и государственных расходов, так и домашних расходов. На основе выбранных переменных был проведен корреляционный анализ методом ранговой корреляции взаимосвязи между успеваемостью учащихся и объемом государственного финансирования образования. В исследовании был сделан вывод, что на успех студентов в образовании влияют нефинансовые факторы, такие как образовательные стандарты и соответствующие методы обучения. В то же время, была выявлена парадоксальная ситуация, практически каждый год правительство увеличивает ежегодные расходы на образование в средних школах, но успеваемость учащихся постоянно падает. Кроме того, не была выявлена сильная статистическая взаимосвязь между успеваемостью учащихся и объемом государственного финансирования образования. Поэтому возникает вопрос об эффективности использовании выделенных государственных средства на образование.

Ключевые слова: государственные расходы, успеваемость учащихся, образование, финансы, человеческий капитал, экономическое развитие

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* **Корреспондирующий автор:** Кушебаев Ж.Т. – магистр наук, преподаватель кафедры Туризм и гостеприимство, Университет международного бизнеса им. К. Сагадиева, Алматы, Казахстан, e-mail: kushebayev@gmail.com

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Introduction

Education is the most important sphere of economics, which largely determines society's intellectual and cultural state. Even though in recent years, increased attention has been paid to reforming universities, general education also requires modernization, primarily to provide equal opportunities for the entire population of the country to receive quality educational services. School funding has traditionally been viewed from two perspectives: the main issues have always revolved around how funds are received and used by schools and how funding is allocated to local educational institutions. Over the past few decades, there has been increasing discussion of the relationship between student achievement and school funding levels.

The lack of financial resources in schools has a negative impact on the quality of training of students and the development of the material base. At the same time, it might cause the departure of the most talented part of the scientific and pedagogical staff. It will reduce the region's socio-economic development level and its competitiveness in the world market. The formation of an effective management system in the field of education, as well as the development of a financing system that meets the requirements of the community, will ensure the solution of problems in this field. Therefore, the problem of education financing should be solved at the state level, it is necessary to improve the school financing system. In this regard, the coverage of the article, which explores financing education in Kazakhstan on the applicability of students, is undoubtedly of high relevance.

Many economists view spending on school education as an investment both in students and in society as a whole. The presence of education can increase the social status of a modern person. Also, education contributes to a higher level of material well-being and social mobility. Meanwhile, the national income rises along with the income of more highly skilled workers. Almost all OECD countries have significantly increased spending on general education, bringing it to the level of 3% of GDP (Pons et al., 2015). Since education is a significant part of government spending, the question of its effectiveness is very relevant. Thus, school financing is one of the major areas of interest within the field of education quality. Many researchers have studied students' academic performance using financial variables.

The state budget plays a special role in financing the educational services of institutions. Education is a public good that the market like

all other social needs of society, cannot fully finance. This is the main reason for the state's participation in the field of education. The constantly growing role of the human factor determines the government's involvement in solving the education system's issues in many pressing social problems of society. In the preamble of the World Conference on Higher Education, held in Paris in July 2009, within the framework of UNESCO, it is written that "... education as a public good is the responsibility of all stakeholders, especially governments. In the face of today's and tomorrow's most complex global challenges, education has a social responsibility to help us understand and improve our ability to respond to various issues, including social, economic, scientific, and cultural aspects. It should become the leading force of society in the formation of global knowledge to solve global problems such as food security, climate change, water management, intercultural dialogue, the use of renewable energy sources, and public health" (Unesco, 2009).

Our findings deepen the current understanding of the financing and budgeting of schools. Because there has been little quantitative analysis of the effectiveness of state expenditure on secondary schools in Kazakhstan. What we know about financing efficiency is based mainly on foreign empirical studies. The paper aims to uncover the relationship between students' achievements and expenditure on secondary education. Moreover, it has an objective to find out how the funding of schools contributes to students' academic performance. This study's findings suggest a negative correlation between expenditure on secondary schools by the state and student achievements. The particular significance of this study lies in the contribution to the economic field since the relationship between state expenditure and students' academic achievements have not been studied in Kazakhstan's case.

Literature review

Many scholars believe that investment in school education may bring the highest return value for each individual and society. Moreover, people's achievement in life depends on their contribution to school education. The studies of Afonso et al. (2005), Fakin and de Crombrugge (1997), which did comparative analysis for OECD countries, can be highlighted among international comparisons of the efficiency of public sector spending. In the same vein, Clements (2002) estimated the effectiveness of

educational spending in European countries. Numerous studies have attempted to explain the relationship between expenditure in school and students' achievement. One of them was the work of Jackson, Johnson, and Persico (2015), who revealed that the number of students who graduated high school increased by 7.1 percent when schools raised their spending by 10 per cent. In the same vein, in 2013, Cascio et al. published a paper in which they found that increased amount of state expenses on secondary education decreased high school dropout rates for whites, but they did not affect blacks. Another point of view is shared by researchers who argued that not only government spending, but also financial support for families positively affects students' school achievements (Parcel & Dufur, 2001; Li & Qiu, 2018).

However, some experts noted that the increase in spending on the quality of education does not always bring positive results. Therefore the idea of further increasing funding gives way to the task of improving the efficiency of national school education systems (DeGrow, 2007). One of the earliest and most famous studies on this subject is the report entitled "Equality of Educational Opportunity" (or simply "The Coleman Report"), published in 1966 in the United States. The US Congress funded this large-scale study to identify the reasons why it is not possible to eliminate the difference in achievement between white and black students. The study argued that variation in school funding had almost (or entirely) nothing to do with student achievement.

Likewise, Hanushek et al. (2004) claim that teacher salaries (depending on experience and level of education) are not correlated to student achievement. In other words, how much teachers get paid for their work does not affect how students perform. Teachers whose students show improvement in academic performance can earn low and high salaries. Therefore, since teacher compensation is one of the most important aspects of school spending, it can be concluded that school spending generally is not related to student achievement.

This view was supported by McEwan and Marshall (2004), who did not find a significant impact on the level of educational attainment of such factors as spending per student and the number of students per teacher. Likewise, Lee and Barro (2001) found a strong relationship between enrollment per teacher and student outcomes, while the impact of government spending per student was not statistically

significant. In this work, the average salary of teachers was also considered as an explanatory variable, but only in primary education, and its positive, albeit weak, effect was noted.

The lack of association between education spending and students' achievement has been confirmed for decades. Thus, from 1970 to 1994, there were changes in education spending in some individual OECD countries and some countries in East Asia. The cost of education per student increased significantly during this period in all the countries under consideration. However, a comparison of test scores suggests that none of the countries has seen a significant improvement in average student performance (Gundlach & Wößmann, 2001). The experience of some countries (in particular, the USA) has shown that, despite the increase in funding for the education sector, test results can become even worse compared to previous indicators, from which it was concluded that there is practically no relationship between student performance and the monetary resources invested by the country in education (Hanushek & Woessmann, 2017).

In addition, several authors have reported that one of the significant problems in the education sector is the ineffective use of finance which causes the low quality of education (Al-Kaisi et al., 2017; Sazhin & Saraikin 2016; Nakhratova et al., 2017).

Among researchers, there is still no agreement on the relationship between the financial resources of schools and students' academic achievements: some have noted the existence of such a relationship, while others have noted its absence. Thus, inconsistency in literature pushes the author to check whether the amount of expenditure on secondary schools has an impact on the achievements of students in the case of Kazakhstan. Consequently, the contribution of this article in the scientific field may reflect the need to increase state funding for secondary schools so that student achievements would improve in Kazakhstan since such studies have not been conducted before. Because in the world, the need for and importance of financing secondary schools shows that education spending is an effective and, most importantly, necessary investment since the demand for highly qualified labor has been steadily growing in the labor market lately.

Methodology

This study used a quantitative approach to address the research aim. According to Babbie (2020), quantitative research effectively

demonstrates the relationship between variables within a population. In terms of data, the author utilized only secondary data because of its availability and reliability. All data used in the data analysis part was taken from two sources. The first data set illustrated the student's achievement in secondary schools over 11 years between 2010 and 2021. The second and third data set demonstrated state and household expenditure, respectively, over the same period. All of these data were taken from Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics.

In most recent studies, student achievement in schools has been measured by dropout rates. For example, Coleman, J. S. (1966) took dropout rates in Brazilian municipalities, whereas Jackson et al. (2016) used dropout rates in the USA. In Kazakhstan's case, it is important to note that it is difficult to find reliable data representing the dropout rate. Therefore, in this study, students' achievement was measured by the average score of unified national testing.

Correlation demonstrates the relationship between two variables. Regression estimates how one variable affects another. Two variables are considered symmetrically in correlation analysis while in regression analysis, one variable is assumed to depend asymmetrically on the other. Extensions to sets of quantities are important. Suppose that for each variable x , the other variable y has a probability distribution $p(y|x)$, the probability of y given by x . The mean value of this distribution, alternatively called the expectation of y , given x , and written $E(y|x)$, is a function of x and is called the regression of y on x . The quantity x is often called the independent variable, though a better term is regressor variable: y is the dependent variable. The regression tells us something about how y depends on x . The simplest case is linear regression, where $E(y|x) = \alpha + \beta x$ for parameters α and β : the latter is called the regression coefficient (of y on x). Other features of the conditional distribution $p(y|x)$ are usually considered in addition to the mean. The variance (or standard deviation) measures the spread of the y -values, for fixed x . A common case is where this is constant over x : the regression is then said to be homoskedastic. A further common assumption is that $p(y|x)$ is normal, or Gaussian. Then y is normally distributed about $\alpha + \beta x$ with constant variance σ^2 .

The regression concept of y on x does not involve a probability distribution for the regressor x . If it does have one, $p(x)$, then x and y have a joint distribution given by $p(x,y) =$

$p(y|x)p(x)$. This joint distribution yields variances, σ_{xx} and σ_{yy} , for x and y , and a covariance σ_{xy} . The correlation between x and y is then defined as $\rho_{xy} = \sigma_{xy} / (\sigma_{xx} \sigma_{yy})^{1/2}$. It is the ratio of the covariance to the product of the standard deviations and is unaffected by a change of scale in either x or y (since the variances and covariance are unaffected by a change in origin). It is easy to show that $-1 \leq \rho_{xy} \leq 1$, and if x and y are independent, ρ_{xy} is zero. When $\rho_{xy} = 0$, x and y are said to be uncorrelated. The correlation measures the association between x and y . If x and y have a joint distribution, then not only is there a regression of y on x , considered above, but also of x on y (Lindley, 1990).

The type of measurement scale(s) used in observing the multivariate outcomes is central to the choice and validity of a multivariate analysis. A nominal scale only defines categories or groups of a variable (e.g., blood type), while an ordinal scale provides meaningful ranking (e.g., pain level: minimal, moderate, severe, unbearable). Both nominal and ordinal scale data imply using specific methods for categorical data analysis. Continuous data can be on either an interval scale if all differences of the same size are equivalent, or a ratio scale if ratios of the same size are equivalent. Most multivariate methods can be applied to analyzing continuous data if additional assumptions such as Gaussian distribution, are valid.

Factor analysis can be either confirmatory or exploratory, depending on the availability of a priori knowledge of the factor structure. The structural equation model discussed earlier in the article can serve as the confirmatory method for testing the hypothesized factor model. EFA, on the other hand, allows one to identify and characterize latent factors (constructs) that underlie or attribute to the relationships of the observed variables. The procedure was developed in the early 1900s to understand the causal relationship between the latent traits of human intelligence and test scores obtained in several domains. It was believed that the relationships of the test scores can be fully explained by one common latent intelligence factor and that if this factor was removed, the test scores would be uncorrelated. The model was later generalized to multiple factors. EFA can be viewed as a dimension reduction tool as the number of factors typically is much smaller than the number of variables.

Like most of the exploratory multivariate methods, EFA models the covariance structure of the data. Contrasting to PCA, which constructs

new variables as linear combinations of the original variables, EFA assumes each observed variable is a linear combination of the latent factors, namely for subject $i \in \{1, \dots, N\}$

$$y_i = \Psi_y f_i + e_i \tag{1}$$

with Ψ_y a matrix of weights, f_i a vector of random, unobserved latent factors, and e_i a vector of random errors. The assumption of independent f_i and e_i with $\mathcal{V}(f_i) = \Sigma_f$ and $\mathcal{V}(e_i) = \Sigma_e$ results in a structured covariance matrix of y_i , that is, $\mathcal{V}(y_i) = \Psi_y \Sigma_f \Psi_y' + \Sigma_e$. The model then decomposes the covariance of y_i into the portion that can be attributed to the common factors $\Psi_y \Sigma_f \Psi_y'$, and the portion that cannot be accounted for by the common factor Σ_e . The communality or common variance is given by the diagonal elements of $\Psi_y \Sigma_f \Psi_y'$, while the uniqueness or specific variance is given by the diagonal elements of Σ_e . The diagonal matrix Σ_e indicates that errors $\{e_i\}$ are uncorrelated given the latent factors, and leads to the interpretation that the inter-relationships between the p outcome

variables are completely explained by the m latent factors. With $\Sigma_f = I_m$, the model reduces further such that $\mathcal{V}(y_i) = \Psi_y \Psi_y' + \Sigma_e$. Common approaches for parameter estimation include the least square principle, which minimizes the sum of squared differences between population elements and sample covariance matrices, and the ML principle, which assumes a Gaussian distribution for y_i (Chi, 2012).

To address research objectives, the author has utilized correlation analysis between students' achievement, and the state and household spending. After that, multivariate correlation analysis was conducted to assess those independent variables' predicted impact on students' performance.

Findings and Analysis

The relationship between student achievement, state funding, and household expenditure was analyzed using correlation analysis. The table below illustrates the result of that analysis. It can be seen from the data in Table 1 that the correlation coefficient between student achievement and budget expenses is -0,66.

Table 1 - The result of the correlation analysis

	Budget Expenses	Household Expenses	Student Achievement
Budget Expenses	1		
Household Expenses	0,953646265	1	
Student Achievement	-0,6647792	-0,649191378	1

Note: Compiled by the authors

This means that these two variables have a strong negative correlation. This says that if the state increases expenditure on school expenses, then the average score of unified national testing decreases. That is interesting because, as discussed in the literature review, previous studies have not found this relationship. This case can give a hint that the state's money directed to increase the quality of education has not been efficiently utilized by schools. Therefore, it arises the problem of mismanagement of school finance. Experts in the education field have reported that the low result of high school graduates is mainly related to several factors. For example, in 2011, the government of Kazakhstan spent around 411 389 457 000 tenge on secondary schools, and that year the average score of unified national testing was 86,7 points. However, the following year the total budget expenses increased to 514 460 580 000 tenge, but the average score of unified national testing

decreased to 70,9 points. In percentage terms, total budget expenses rose by 20 per cent while the average score of unified national testing decreased by 18 per cent.

Similarly, the state expenditure on school needs in 2019 was more than in 2018 by 20 per cent, whereas the average score of unified national testing in 2019 was less than in 2018 by 22 per cent. The main reason for the low test result could be explained if, previously, senior classes in Kazakhstan were focused on preparing students for admission to higher educational institutions. Still, after the emergence of a national unified testing system, school teachers focused only on getting high scores on the test. The role of the middle classes in such an educational system remains unclear to school administrators and teachers. This, in turn, leads to a decrease in the requirements for the professionalism of secondary school teachers and a decrease in their motivation, as well as a deterioration in the quality

of education provided to students. To overcome this problem, it is necessary to revise the content and purpose of secondary school education.

Also, from table 1 we can notice a very strong positive correlation between two independent variables. The correlation coefficient is close almost to one. This calls the problem of multicollinearity. Therefore, household expenditure was not included in the model.

Then the true model of this study is expressed followingly

$$Student\ Achievement = \beta_1 - \beta_2 State\ Expenses + u.$$

In this sample, the average annual government expenses on secondary schools were 777 606 251 000 tenge, with the smallest and largest being 358 796 459 000 tenge and 1 783 806 118 000 tenge, respectively. The average score of unified national testing over the 11 years between 2010-2021 was 76,43 points, with the smallest and largest values being 64,06 and 84,84%, respectively.

If the state expenses are 0, then the predicted average score of unified national testing is the intercept, 85.81, which equals 85,81 points since the average score of tests is measured in points. At first glance, it seems illogical, because if the government stops financing secondary education, then schools fully stop the operation. However, we must consider that the average score of unified national testing also includes the

score of private schools not financed by the state. As shown the table 2, the R square was 0,44, this means that state expenses explained a 44 percent change in student achievement.

Table 2 - The result of the regression statistics - Summary output

1	Multiple R	0,666702
2	R Square	0,441931
3	Adjusted R Square	0,386125
4	Standard Error	5,886019
5	Observations	12
Note: Compiled by the authors		

After setting the true model, the author performed an OLS regression analysis to express the evaluated model based on analyzed data. According to the coefficients of ANOVA 3, the evaluated model is expressed.

$$85,81 - 1,22 State\ Expenses$$

Next, we must express the predicted change in students' achievement as a function of the change in state expenses: -1,22 (State Expenses). This equation indicates that if the state expenses increase by 10 billion tenge, then students' achievement is expected to decrease by 1,22 points. Table 3 shows the results coefficients of ANOVA.

Table 3 - The coefficients of ANOVA

	df	SS	MS	F	Significance F			
Regression	1	274,3536	274,3536	7,918943	0,01834662			
Residual	10	346,4523	34,64523					
Total	11	620,8059						
Coefficients			t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	85,81001	3,74032	22,9419	5,5892	77,4761245	94,144067	77,47612	94,144067
Budget Expenses	-1,21523	4,31841	-2,8141	0,01835	-2,177E-08	-2,53E-09	-2,177E-0	-2,53E-09

Note: Compiled by the authors

According to this model, we can compare the predicted average score of unified national testing at various values of annual state expenditure. For example, if the government increases state expenditure on secondary schools by 100 billion tenge, then the predicted average score of national testing decreased by 12,2 points.

However, it is difficult to believe that increase in state expenditure causes bad achievements. This might be explained that the error term u in the equation is correlated with the government expenses on secondary education. In fact, u contains factors such as the ineffective use of state finance by the head of schools, which influences

the quality of education. Another explanatory variable such as corruption rate in schools is also contained in u , and that is more likely correlated with state expenditure.

Therefore, we recommend that the government work on designing and implementing school funding policies that allow effective spending of budget money. What matters is not so much the number of resources school systems have but how those resources are used. Educational institutions should be given a certain degree of independence and autonomy by the local government in managing their finances, as this greatly impacts student outcomes. The results of the PISA study showed that the independence of school management in decision-making on various management issues is positively related to school academic performance. As schools become more independent in managing their financial resources, students' academic performance also increases (OECD, 2010).

The low level of autonomy of educational institutions in Kazakhstan could be considered a deterrent to improving the quality of the functioning of the country's educational system and raises the question of the need to restructure the budgetary network. At the same time, the preservation of non-transparent principles of school financing could lead to inefficient use of budgetary funds, not to mention the development of corruption in this sector of the education system.

It also should be noted that financial resources poured into secondary education can significantly affect the quality of education in the long term but not in the short term. In an analysis of correlates, determinants, and consequences of education consumption, the data suggest that expenditures on educational institutions do not adequately explain cross-state differences in educational outcomes (Roser & Ortiz-Ospina, 2016).

The available evidence on the importance of the school's contribution to learning suggests that learning outcomes may be more sensitive to increased teacher quality than to increased class size. Regarding household spending, recent empirical evidence suggests that interventions that increase the benefits of schooling (e.g., conditional cash transfers) are more likely to increase the time students stay in school.

Conclusions

This article does not consider all the factors affecting the quality of education. We were only interested in financial indicators. Overall,

regression analysis of the data collected by the authors did not find a strong relationship between student performance and the amount of government funding for education. The results of this study should be taken into account in the future in the development of school financing policy in Kazakhstan. Also, an indicator such as spending per student should be thoroughly studied when developing an education financing model. At the same time, it should be remembered that the continuous increase in funding is a necessary but not sufficient condition for improving the quality of education. The success of students is mostly affected by non-financial factors, primarily the educational standards adopted in the country, as well as the corresponding teaching methods. The educational process in Kazakhstan provides students with a significant fund of knowledge in a wide range of academic subjects. However, the fact that school graduates and school teachers focus only on the subjects included in the national unified test has the effect of significantly reducing the quality of school education. Accordingly, changing the current teaching methods following international standards is very important.

In conclusion, this paper has argued that government spending on secondary education does not always bring positive results in increasing students' achievement. The reason for that was ineffective use and control of school expenditure. One of the more significant findings to emerge from this study is that government expenses on secondary schools were strongly negatively correlated with the performance of high school graduates in unified national testing. The results of this research support the idea that school autonomy in decision-making on a wide range of financial issues might be positively correlated with academic performance. The current findings may add some interesting points to a growing body of literature on school finance. The conclusions of this study are subject to at least two limitations. First, students' achievement was not measured by dropout rates that were widely used in relevant studies. Because of the lack of access to dropout rates in secondary schools in Kazakhstan, the author has utilized the annual average score of unified national testing as the measurement of educational performance.

Secondly, the author intended to use multiple regression analysis with two explanatory variables, but those variables demonstrated a multicollinearity issue. Therefore, further work needs to be done by adding variables such as school corruption rates.

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Information about the authors

* **Zhassulan T. Kushebayev** – master of science, lecturer of the department Tourism and Hospitality, K. Sagadiyev University of International Business, Almaty, Kazakhstan, e-mail: kushebayev@gmail.com, ORCID ID: <https://orcid.org/0000-0002-5243-2222>

Galym S. Nygymetov – candidate DBA, M. Narikbayev KAZGUU University, Astana, Kazakhstan, e-mail: g.nygymetov@nu.edu.kz, ORCID ID: <https://orcid.org/0000-0002-7114-5122>

Авторлар туралы мәліметтер

* **Қушебаев Ж. Т.** – ғылым магистрі, Туризм және қонақжайлылық кафедрасының оқытушысы, К. Сағадиев атындағы Халықаралық бизнес университеті, Алматы, Қазақстан, e-mail: kushebayev@gmail.com, ORCID ID: <https://orcid.org/0000-0002-5243-2222>

Нығыметов Ғ.С. – DBA докторанты, М.С.Нәрікбаев атындағы КАЗГЮУ университеті, Астана, Қазақстан, e-mail: g.nygymetov@nu.edu.kz, ORCID ID: <https://orcid.org/0000-0002-7114-5122>

Сведения об авторах

* **Қушебаев Ж.Т.** – магистр наук, преподаватель кафедры «Туризм и гостеприимство», Университет международного бизнеса им. К. Сагадиева, Алматы, Казахстан, e-mail: kushebayev@gmail.com, ORCID ID: <https://orcid.org/0000-0002-5243-2222>

Нығыметов Ғ.С. – докторант DBA, Университета КАЗГЮУ им. М.С. Нарикбаева, Астана, Казахстан, e-mail: g.nygymetov@nu.edu.kz, ORCID ID: <https://orcid.org/0000-0002-7114-5122>