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Artículos Científicos

La gestión directiva y los rendimientos de alumnos en educación media superior

School management and student performance in upper secondary education

Gestão diretiva e desempenho dos alunos no ensino médio

José Ángel Vera Noriega
Universidad de Sonora, México.
Jose.vera@unison.mx
https://orcid.org/0000-0003-2764-4431

Luis Enrique Fierros Dávila
Universidad de Sonora, México
luisenrique.fierros@unison.mx
https://orcid.org/0000-0002-2212-3445

José Alberto Fraijo Figueroa
Universidad de Sonora, México
jose.fraijo@unison.mx
https://orcid.org/0000-0001-9365-9282

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Resumen

En la actualidad, el sistema educativo en México afronta ciertas situaciones de cambio y reestructuración que afectan el funcionamiento de todos los niveles educativos. De hecho, algunas investigaciones han identificado diferentes elementos que impiden el desarrollo normal del proceso educativo, como el desempeño del docente en clase, el interés y motivación del alumno, el ambiente donde se desenvuelve la institución, y un aspecto de gran relevancia: el papel del director en su institución. Por eso, el objetivo del estudio fue estimar la relación entre las características del director del plantel como variable de contexto y su relación con el rendimiento de los alumnos. Para ello, participaron 265 directores de instituciones de educación media superior del estado de Sonora, elegidos aleatoriamente, a quienes se les aplicó un instrumento que evaluaba elementos de sus contextos. Se realizó un análisis multivariado discriminante que permitió diferenciar a los directores de estudiantes con alto y bajo rendimiento, con una efectividad de pronóstico de 88.40 %. Las variables que más contribuyeron a las diferencias fueron *juntas y cursos*, *infraestructura* y *salario y problemas*. Se puede concluir que solamente las acciones que están en el radio de acción de los directores son las que efectivamente coadyuvan a la generación de estudiantes con alto rendimiento.

Palabras clave: director de escuela, educación media superior, rendimiento académico.

Abstract

Today the educational system in Mexico faces certain situations of change and restructuring that affect the functioning of all educational levels. Some researches have identified different factors that affect the educational process, such as the teacher's performance in class, the student's interest and motivation, the environment where the institution develops, and an aspect of great relevance: the role of the principal in his or her institution. The objective of the study was to estimate the relationship between the characteristics of the school principal as a context variable and its relationship with the performance of students at the school, evaluated with a measure of mastery based on the school curriculum. A total of 265 randomly selected high school principals from the state of Sonora participated in the study, who were administered an instrument that evaluates elements of the context in which they work. A multivariate discriminant analysis was carried out to differentiate principals of students with

high and low performance, with a predictive effectiveness of 88.40%; the variables that most contributed to the differences were: Meetings and Courses, Infrastructure, and Salary and Problems. It is observed that only the actions that are within the principals' radius of action are the ones that effectively contribute to the generation of the most effective results.

Keywords: school principal, upper secondary education, academic performance.

Resumo

Atualmente, o sistema educacional no México enfrenta certas situações de mudança e reestruturação que afetam o funcionamento de todos os níveis educacionais. De fato, algumas investigações identificaram diferentes elementos que impedem o normal desenvolvimento do processo educacional, como o desempenho do professor em sala de aula, o interesse e a motivação do aluno, o ambiente em que a instituição atua e um aspecto de grande relevância. : a função do diretor em sua instituição. Portanto, o objetivo do estudo foi estimar a relação entre as características do diretor do campus como variável de contexto e sua relação com o desempenho dos alunos. Para tanto, participaram 265 diretores de instituições de ensino médio do estado de Sonora, escolhidos aleatoriamente, aos quais foi aplicado um instrumento que avaliou elementos de seus contextos. Foi realizada uma análise multivariada discriminante que permitiu diferenciar os diretores dos alunos com alto e baixo desempenho, com eficácia prognóstica de 88,40%. As variáveis que mais contribuíram para as diferenças foram diretorias e cursos, infraestrutura e salário e problemas. Pode-se concluir que apenas as ações que estão no raio de ação dos diretores são aquelas que efetivamente contribuem para a geração de alunos com alto desempenho.

Palavras-chave: diretor de escola, ensino médio, desempenho acadêmico.

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Introduction

Currently, the educational system in Mexico faces certain situations of change and restructuring that affect the functioning of all educational levels (Organization for Economic Cooperation and Development [OECD], 2020). An example of this is the reform proposal of the new educational model 2019, where coordination is proposed between all levels of education, including upper secondary education (EMS) in the compulsory basic program in order to provide citizens with quality in their educational training (Ministry of Public Education [SEP], 2019). For this, however, "there must be a clear and efficient school management within educational establishments" (López, 2010, p. 148).

In this sense, the EMS has some challenges that are located in the areas related to a) access, equity and coverage; b) quality and c) management, integration and coordination of the system (Uribe, López-Córdova, Mancera and Barrios, 2012). The first two items were raised again by Bustamante, Székely and Martínez (2017), who highlight how crucial it is to be cared for in order to optimize the functioning of the EMS. For this, emphasis should be placed on the use of resources and how they are used to achieve the school's objectives in terms of educational quality (Pacheco, Robles and Ospino, 2018).

However, it is in the task of articulating the objectives of the educational system and the institutional goals set for the achievement of educational quality where, on occasions, there is a break between the assigned duties and the implementation of the actions proposed by the system (Quintana Torres, 2018). In this framework, school management emerges as a joint work tool that should allow taking a position regarding the achievement of goals. This, of course, demands a joint effort to offer actions that are adjusted to the conditions of each institution.

Principals and their relationship to student achievement

The director is the person who has the function of making decisions for the administration of financial resources and personnel, as well as to attend to needs related to the development of academic knowledge. This vision includes a management capacity and understanding of the dynamics of the elements that make up the entire educational system of the campus (Acosta, 2009), although it is known that in some cases the managers lack the capacities to solve the demands (Sardon, 2017) .

In this sense, different studies on the administration of educational organizations indicate a high correlation between the quality of teaching, the learning that takes place in schools, and the quality of the principal's leadership (Acosta, 2009; Guzmán, 2018; Horbath and García , 2014; Pacheco et al., 2018).

Peniche and Cisneros-Cohernourm (2013) explain that the director's functions also include actions that are aimed at improving instructional leadership and personal and professional development of their teachers. However, in order to propose effective proposals that allow optimizing educational dynamics, empirical research work must be carried out (Tolozano, Ferrer and Forgas, 2017).

All of the above leads us to consider the functions that the principal performs or should perform as an important element in the context in which the students develop, since his decisions can impact the school performance of the students (Bitar, 2012; Vélez, 2012).

However, in a general way (and based on the available bibliography) it can be affirmed that there is little research that relates directive management with the academic performance of students, since most of the time leadership is measured in relation to attitudes and opinions of teachers or students (table 1).

Tabla 1. Variables estudiadas en la relación ejercicio del director y efecto en el rendimiento escolar de los estudiantes

Autor (año)	Variables
Chain (1995) y Pérez-Franco (2001)	Factores sociales y económicos referidos a condiciones materiales de vida y condiciones culturales.
Elmore (2004)	Práctica y competencia pedagógica. Promueve el aprendizaje continuo del personal, se genera una condición de aprender y mejorar más que cumplir con dictados institucionales. Ejercicio recíproco de responsabilidades y capacidades.
Garay y Uribe (2006)	Focalización en los aprendizajes en un ambiente ordenado (con énfasis en la disciplina de los procesos pedagógicos) en las distintas formas de aprendizaje y ritmo de los alumnos. Convicción en creer sin limitaciones (altas expectativas) en las capacidades de aprendizaje de los estudiantes.
Hunt (2009)	Efectividad docente y relación con el clima de la escuela. El liderazgo y supervisión ejercidos por el director.
CEPPE (2009) y Bush y Glover (2003, citados por Vázquez, 2013)	Liderazgo instruccional (o liderazgo educativo).
Vélez (2012)	Gestión del director sobre parámetros técnico-administrativo-docentes y mejoría en calidad educativa.
Tolozano *et al*. (2017)	Orienta y crea las condiciones en el uso de los diferentes recursos. Funciones del director: planeación, organización, mando, ejecución, control y evaluación de todo el proceso.
Sardon (2017)	Prácticas del liderazgo transformacional: -La motivación inspiradora. -La estimulación intelectual. -La influencia idealizada. -La consideración individualizada.
Pacheco *et al*. (2018)	Capacidad de gestión. Toma de decisiones. Capacidad de coordinación de acciones y su implementación.

Fuente: Elaboración propia

Previous studies emphasize that the director's leadership is one of the variables that influences effectiveness, but how and to what extent is not explained. In fact, the different investigations conclude that a) the effects of leadership (direct and indirect) explain 25% of the total effects on school achievement (Vázquez, 2013); b) school leadership is the second most important variable in student learning (the first is the teacher's teaching in the classroom) (Bravo and Verdugo, 2007); c) school leaders (principals) improve teaching and

learning through their influence on staff motivation, engagement and working conditions; and d) school leadership has a greater influence on the school and on students when it is widely distributed.

For her part, Maureira (2006) states that research in this area has identified some common characteristics associated with successful leadership: a) strength in purpose, which refers to the ability to print dynamism or mediation between negative change agents ; b) involve the academic body in decision-making, this in relation to the principal's ability to share leadership with his or her management team and integrate teachers into certain decision-making processes; and c) professional competence in the teaching and learning processes, an essential characteristic to establish an ancestry over the teachers.

Likewise, Sardon (2017) finds a high significant relationship between the variables of transformational leadership and school management. According to the author, when exercising his leadership, the manager must know how to communicate with the people on the school campus and act as the situation demands, in compliance with the established objectives.

Due to all of the above, the objective of this research was to estimate the relationship between the characteristics of the campus principal as a context variable and its relationship with the performance of the campus students. The general hypothesis of the study is assumed as a differentiation between performance levels and managerial management styles.

Methodology

Population

Of the 651 acting directors, 272 were randomly chosen. However, after careful review of the database, seven participants were eliminated because they presented incomplete information, leaving the sample made up of 265 subjects. For this, the table prepared by Tagliacarne (1968) for infinite populations was used, with a 5% error for a probability of 50 out of 50 and a 95% confidence interval equivalent to two sigmas (Sierra-Bravo, 1985). The total sample was weighted as follows: 40.66% for the second semester, 31.51% for the fourth semester and 27.78% for the sixth semester. All EMS institutions and the sample were designed for the state of Sonora, Mexico.

Instrument

A questionnaire made up of 40 items in various dimensions was designed to assess various elements of the context in which the directors who participated in the study operate. These dimensions are described below:

- General data: It was composed of 11 items: sex, marital status, number of children, type and name of the school, seniority in teaching, seniority in the institution, academic degree, area of study, work activities outside the institution, productivity and participation in the teaching career.
- Management work: It consisted of the following: meetings with parents, planning meetings with teachers, meetings with supervisors and authorities of the Ministry of Education and Culture (SEC) or of the institution itself, training courses for teachers, meetings with students, procedures for the acquisition of new equipment, meetings to develop research projects, cultural, sports or social activities with students and promotion of external academic events among teachers on campus.
- Work conditions and organizational climate: This sought to gather information on the evaluation that the director makes of his work environment and his relationship with his practice, as well as his levels of satisfaction. The subscales included were attention to academic organization, equipment, student achievement, attendance and punctuality, infrastructure, salary, performance and communication. The items that made up this section were attention to library staff, support for the joint work of teachers and students, holding academic events, equipping classrooms, laboratories and workshops, about their ability to coordinate work teams, working conditions in their institution, communication with students, teachers and parents, etc.
- Management and directive activities: The objective was to obtain information on the substantive activity of the principal, which was made up of four subscales: administrative management, planning, teaching management and relationship with parents. The items focused on financial resource management to improve infrastructure, extracurricular activities, graduate studies for their teachers, incentivize teachers to continue their studies, inform parents about their children's performance, etc.
- The students: This dimension was made up of four subscales: improvement of student performance, motivation and training, problems, and more problems. The items

focused on communication with students, communication between students and teachers, administrative problems, innovation in information and communication technologies, promotion of scholarships, etc.

Procedure

- First stage: In this, the place where the process and the reception of the logistics formats would take place was established.
- Second stage: The monitor was in charge of managing the application of the exams in the institution. The place of origin was identified and accredited. The objective and the dynamics that the team would develop in the school were indicated to the principal of the campus. Likewise, support was requested to carry out the interviews with the participating directors. When they answered the instrument, it was checked to verify that there was no missing item to answer. In such cases, they were requested to terminate them (if possible). There was no time limit. All directors signed informed consent.

Results

Cluster analysis of academic performance

Before focusing on the general objective of this work, we must first integrate and differentiate the clusters based on the variables of student achievement. For this, the cluster analysis was used, which was of the non-hierarchical type using the K-means procedure. The global average that the students obtained individually in the application of the achievement instrument was introduced as a variable, which includes mathematics, Spanish and science. Details on the composition and distribution of measures of central tendency and dispersion of global achievement scores are found in Vera, Fierros and Peña (2014) and Fierros (2014). In the references above, two-, three-, and four-cluster models were explored to cover the largest number of subjects and values per subject (high, medium, and low values). Ultimately, the last one was the one that met with a number of iterations less than 15, and the deviations of the centroids were never greater than two standard deviations for each subject. Thus, it was possible to identify the best performing group (cluster 4), two medium performance groups (clusters 3 and 2) and a low performing group (cluster 1).

As can be seen in table 2, according to the robust F values of the Anova, it can be noted that the global average was consistent enough to explain, without a doubt, the formation of the reported conglomerates. The K-means method allows assigning to each observation the cluster (conglomerate) that is closest in terms of the centroid (mean or distance). In this sense, it can be observed, in the same table, that the centroids are very well defined and that they solidly describe the constitution of the four clusters, also considering the robust value of F. Also, the number of students considered, the number of iterations , the value of the centroids and the robust values of F allow us to confidently consider the analyzes carried out and the results obtained so far.

Tabla 2. Conglomerados y parámetros de la solución obtenida

Conglomerados								
	COBACH	Alum	CONALEP	Alum	DGETI	Alum	Privadas	Alum
1	33.50	22	26.98	25	27.16	122	34.00	61
2	41.15		38.33		34.72		45.21	
3	49.72				42.45		52.94	
4	61.10	39	45.90	21	50.04	22	63.51	23
F	794.69		352.46		1223		808.57	
Sig.	0.000		0.000		0.000		0.000	
Iteraciones	12		13		12		12	
Distancia	7.647		7.609		7.565		7.731	
Alumnos	168		69		452		138	

Fuente: Elaboración propia

In the case of students from the Colegio de Bachilleres del Estado de Sonora (COBACH), a significant difference can be observed between the high and low performance clusters (means of 61.10 and 33.5, respectively). A similar difference can be seen in the groups that correspond to the National College of Technical Professional Education (CONALEP) (45.9 and 26.98 means for the high and low performance groups, respectively). Regarding the students of the General Industrial Technological Directorate (DGETI), the high-performance group shows an average of 50.04, and the low-performance group 27.16. Finally, high-achieving students from private high schools have an average of 63.51, while low-achieving students have 34. In these terms, it can be noted that the best performance corresponds to the group of students from private high schools.

In this regard, it should be noted that the schools that provide a greater number of high-performance students are located in population centers with adequate infrastructure and material conditions (eg, Hermosillo, Ciudad Obregón, Magdalena, etc.). These schools have traditionally been recognized for the high quality of their graduates and because they carry out their activities under favorable conditions (De la Cruz, 2016). In fact, most of these students only have their academic training as their main obligation. However, it should not be overlooked that even in these localities the phenomenon of low yield is also present, which allows us to infer that there are other variables that influence the persistence of this problem.

However, those who present a greater number of students with low performance are the schools that are located in disadvantaged populations (eg, Pueblo Yaqui, Nacozari, Navojoa, Huatabampo, etc.), which tend to have the highest rates of state poverty.

In addition to the above, it should be noted that the assignment of the shift to study depends on the grades of each student, that is, those with the best performance are assigned morning classes, while the afternoon shift is available to the other students. On this division of schedules, Vera, Huesca and Laborín (2011) comment the following:

> The evening shift and the consumption of alcoholic beverages are related to belonging to the group with low school performance. Those with high performance present a direct relationship with the cultural heritage, its current average and the discussion of previous reading; However, the pedagogical techniques implemented by the teacher, as well as those used by the students, do not guarantee adherence to the high-performance group (p. 62).

On the other hand, it is observed that the second semester contributes a greater number of high-achieving students, while the opposite occurs in the sixth semester. This effect is explained by Vera et al. (2011), who point out that in the first and second semesters it is not possible to observe important changes in the levels of performance associated with the context variables. However, from the fourth year on, the differences begin to become important and the context variables begin to play a fundamental role in the probability of successfully completing high school studies.

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Description of the directive management dimensions

The first subscale (called Managerial work) was made up of two factors: activities and meetings (4 items) (mean = 2.61; standard deviation = 0.91), and meetings and meetings (5 items) (mean = 2.36; standard deviation = 0.87) . Together, the values were the following: KMO of 0.831, explained variance of 49.01 and Cronbach's alpha of 0.784.

From the subscale called Work conditions and organizational climate, six factors were extracted: attention to academic organization (4 items) (mean = 1.87; standard deviation = 0.75); equipment (mean = 1.87; standard deviation = 0.75), student achievement (3 questions) (mean = 1.78; standard deviation = 0.62); attendance and punctuality (mean = 1.73; standard deviation = 0.67), infrastructure and salary (mean = 2.33; standard deviation = 0.98), and performance and communication (mean = 1.77; standard deviation = 0.62). Together, the values were the following: KMO of 0.846, explained variance of 56.63 and Cronbach's alpha of 0.897 (See table 3).

In the Management and directive activities subscale, four factors were formed: administrative management (mean = 2.32; standard deviation = 0.98), planning (mean = 2.24; standard deviation = 0.86), teacher management (mean = 1.95; standard deviation = 0.91) and relationship with parents (mean = 1.87; standard deviation = 0.75) (20 questions in total). Together, the values were the following: KOM of 0.709, explained variance of 50.76 and Cronbach's alpha of 0.848.

Finally, in the subscale on students, four factors were formed consisting of 13 items: improvement in student performance (mean = 2.18; standard deviation = 1.18), motivation and training (mean = 1.86; standard deviation = 0.98), problems (mean = 3.48; standard deviation = 1.12), and more problems (mean = 2.37; standard deviation = 1.19). Together, the values were the following: KMO of 0.793, explained variance of 61.33 and Cronbach's alpha of 0.762.

Tabla 3. Subescalas que constituyen a cada factor de la función directiva, número de reactivos que las componen, medias, desviación estándar promedio, pesos factoriales, KOM, varianza explicada y alfa de Cronbach

	Número de reactivos	Media	DE	PF	KMO	VE	α de Cronbach
Trabajo docente							
Trabajo en equipo	6	2.69	0.99	De 0.42 a 0.76	0.766	47.13	0.71.
Actividades integradoras	4	1.98	1.04	De 0.52 a 0.74			
Actividades mecánicas	3	3.09	1.11	De 0.36 a 0.76			
Materiales NTIC	4	3.61	1.19	De 0.56 a 0.86	0.785	61.13	0.77.
Materiales tradicionales	3	3.33	1.31	De 0.65 a 0.80			
Actividades creativas	5	2.80	1.20	De 0.48 a 0.75	0.836	47.37	0.80
Actividades extrainstitucionales	4	3.63	1.17	De 0.56 a 0.76			
Obligaciones docentes	5	1.44	0.70	De 0.45 a 0.83			
Condiciones de trabajo y clima organizacional							
Condiciones materiales institucionales	27	2.29	1.01	De 0.36 a 0.81	0.912	41.40	0.95
Desempeño de los docente	18	1.74	0.71	De 0.39 a 0.72			
Servicios institucionales	15	2.96	1.21	De 0.35 a 0.70			
Conocimiento del modelo competencial							
Capacitación y conocimiento	4	2.14	0.80	De 0.66 a 0.79	0.757	56.25	0.73
Propuestas de mejora para el desempeño							
Esfuerzos institucionales	7	1.68	0.89	De 0.49 a 0.78	0.851	46.16	0.80

DE = desviación estándar; PF = pesos factoriales; KMO = Keiser-Meyer-Olkin ; VE = varianza explicada

Fuente: Elaboración propia

Profile of managers of high and low performance students

In this group of directors, only one of them has obtained a maximum grade of higher normal (with more than 10 years of seniority in the school) and another the technical level (between 1 and 5 years), although with a lot of experience both and only dedicated to that work (table 4).

Tabla 4. Perfil de directores del grupo de alumnos de alto rendimiento

Antigüedad en la escuela	Antigüedad en la docencia	Último grado obtenido	Realiza otra actividad además de la docencia
COBACH			
Entre 1 año y 5 años	Más de 10 años a 20 años	Maestría	No
Entre 1 año y 5 años	Más de 10 años a 20 años	Licenciatura o ingeniería	No
Más de 10 años	Más de 20 años	Normal superior	No
Más de 10 años	Más de 10 años a 20 años	Licenciatura o ingeniería	No
CONALEP			
Más de 10 años	Entre 1 año y 10 años	Pasante de licenciatura o ingeniería	No
Entre 1 año y 5 años	Entre 1 año y 10 años	Técnico	No
Más de 10 años	Más de 20 años	Maestría	No
DGETI			
Entre 1 año y 5 años	Más de 20 años	Pasante de maestría	No
Más de 5 años a 10 años	Entre 1 año y 10 años	Pasante de maestría	No
Entre 1 año y 5 años	Más de 10 años a 20 años	Pasante de maestría	No
Más de 10 años	Más de 20 años	Licenciatura o ingeniería	No
Menos de 1 año	Más de 10 años a 20 años	Candidato a doctor	No
Privadas			
Menos de 1 año	Más de 10 años a 20 años	Maestría	No
Más de 10 años	Más de 10 años a 20 años	Licenciatura o ingeniería	Sí
Entre 1 año y 5 años	Más de 10 años a 20 años	Licenciatura o ingeniería	No

Fuente: Elaboración propia

Table 5 shows the principals of the schools with low-performing students.

Tabla 5. Perfil de directores del grupo de alumnos de bajo rendimiento

Antigüedad en la escuela	Antigüedad en la docencia	Último grado obtenido	Realiza otra actividad además de la docencia
COBACH			
Más de 10 años	Más de 10 años a 20 años	Maestría	No
Más de 10 años	Más de 10 años a 20 años	Pasante de licenciatura o ingeniería	No
CONALEP			
Entre 1 año y 5 años	Más de 10 años a 20 años	Licenciatura o ingeniería	Si
Entre 1 año y 5 años	Entre 1 año y 10 años	Técnico	No
DGETI			
Más de 10 años	Más de 20 años	Licenciatura o ingeniería	No
Más de 5 años a 10 años	Más de 10 años a 20 años	Maestría	No
Entre 1 año y 5 años	Más de 20 años	Pasante de maestría	No
Entre 1 año y 5 años	Entre 1 año y 10 años	Licenciatura o ingeniería	No
Menos de 1 año	Más de 10 años a 20 años	Candidato a doctor	No
Privadas			
Menos de 1 año	Más de 10 años a 20 años	Licenciatura o ingeniería	No
Entre 1 año y 5 años	Más de 10 años a 20 años	Licenciatura o ingeniería	No
Más de 10 años	Más de 20 años	Normal superior	No
Entre 1 año y 5 años	Más de 10 años a 20 años	Licenciatura o ingeniería	Si

Fuente: Elaboración propia

If the data in Tables 4 and 5 are compared, it is observed that there is practically no difference in the data collected on the characteristics of the directors. Therefore, a question arises: why in both cases the performance of the students is different? To try to provide an answer, let's review the profile of managers using a discriminant analysis model.

Discriminant analysis

A discriminant multivariate analysis was carried out to evaluate the differences between the directors of students with high and low performance. A discriminant function was calculated from the variables contained in the questionnaires, with a significance level of 95% ($p \leq 0.05$). This analysis allowed us to respond to two fundamental aspects:

1. Existence of differences between the groups of students with high and low performance.
2. Variables in which the differences occurred.

In relation to the discriminant classifier multivariate analysis, the following results were obtained:

1. In the discriminant canonical functions, a single function was achieved with an eigenvalue greater than 1 (1.221) and a high canonical correlation (0.742), which shows differences between the groups based on the variables included for this analysis (Table 6).

Tabla 6. Funciones canónicas discriminantes (autovalores)

Autovalores				
Función	Autovalor	% de varianza	% acumulado	Correlación canónica
1	1.221	100.0	100.0	0.742

Fuente: Elaboración propia

2. Box's M test for equality of the covariances of the matrices showed a determinant of 2.469 and its transformation to an F of 0.379, which corresponded to a significance of p = 0.893. These values allow us to accept the hypothesis of homogeneity of covariances of the matrices between the groups, which is equivalent to saying that the variables involved in the analysis are similarly distributed among the groups.

3. In the test to determine the significance of the difference between the groups from the calculated function, a Wilks Lambda value of 0.450 and a Chi-Square value of 31.528 were obtained, and p = 0.000, so it was The difference or discrimination between the groups based on the behavior of the variables included in the analysis and evaluated in this discriminant function was significant (Table 7).

Tabla 7. Valores de Lambda de Wilks, Chi-Cuadrada y nivel de significancia

Lambda de Wilks				
Prueba de funciones	Lambda de Wilks	Chi-cuadrada	gl	Sig.
1	0.450	31.528	3	0.000

Fuente: Elaboración propia

4. The behavior of the standardized canonical coefficients of the discriminant function found, as well as the analysis of the matrix structure showed that the variables with the greatest weight in the differences between the groups were boards and courses (1,193), infrastructure and salary (-1,278) and problems (0.484) (table 8).

Tabla 8. Coeficientes de función discriminante canónica estandarizados

	Función
	1
Juntas y Cursos	1.193
Infra y Salario	-1.278
Problemas	0.484

Fuente: Elaboración propia

5. The discriminant function for these groups showed values of -1,054 for the low-performance centroid group, and 1,105 for the high-performance group, which means a considerable distance in the representation of these compared groups, based on the behavior of the variables used in the study sample (Table 9).

Tabla 9. Funciones en centroides de grupo

	Función
Logro alto y bajo	1
Bajo	-1.054
Alto	1.105

Fuente: Elaboración propia

The unstandardized canonical discriminant functions have been evaluated in group means.

6. The ability of this function to forecast was considered good, since it was possible to correctly classify 21 of 22 directors from the low-performance group (95.5%) in the origin

group, and 17 of 21 high-performance directors (81%). Finally, in general, 88.4% of directors of the sample were classified correctly (Table 10).

Tabla 10. Resultados de clasificación

			Pertenencia a grupos pronosticada		
		Logro alto y bajo	Bajo	Alto	Total
Original	Recuento	Bajo	21	1	22
		Alto	4	17	21
	%	Bajo	95.5	4.5	100.0
		Alto	19.0	81.0	100.0

Fuente: Elaboración propia

In general, the main conclusions derived from the results of the discriminant analysis were the following:

1. The calculated discriminant function allowed to differentiate the directors of the high and low performance groups, with a prognostic effectiveness of 88.40% ($p \leq 0.005$) in this study sample.
2. The variables with the greatest contribution to the differences between both groups were boards and courses, infrastructure and salary, and problems.
3. If we consider the value of the canonical correlation (0.742), the value of Box's M test (2.469 and its transformation to an F of 0.379, with $p = 0.893$), the value of Wilks's Lambda (0.450), the Chi-Squared value (31.528, and $p = 0.000$) and the good capacity of this function to forecast correctly (95.5% in the directors of the low performance group, 81% in the high performance group and 88.4% in general), the discriminant analysis, de facto, becomes an exercise of convergent validity for the director context instrument.

Discussion

The school, as an intermediate training space between the family and the community, reinforces, reproduces but also transforms social processes, so the development of social skills in its students is essential to coexist in a diverse and changing scenario (Gómez, Del Rey, Romera and Ortega, 2015).

The problem lies, however, in that the development of these skills is usually conditioned by multiple variables, such as age, sex, the shift taken, the semester, etc. (Chain, Cruz, Martínez and Jacomé, 2003; Moreira, 2006). In fact, and although sometimes it is not taken into account, the figure of the principal is also important in that purpose because his actions have a direct effect on the structures, processes and other members of the school (Hallinger, 2003; Harris, 2009; Rojas, 2006). Indeed, to ensure an adequate learning environment, it is necessary for the principal to exercise effective leadership that promotes the conditions for a healthy development of students (Sánchez, 2011; Maureira, 2004). Leadership is a component of directive management that includes the ability to guide and motivate subordinates for the fulfillment of activities and school objectives jointly (Cayulef, 2007; García, 2010; Murillo, 2006; Ortega y Rocha, 2011).

In addition, the director of an educational institution is the central piece in the general scheme of government and governance. Therefore, to respond to academic, bureaucratic and political problems, it must have the skills of the manager, the bureaucrat and the prince, "thus mixing the political skills of the prince with the administrative demands of the bureaucrat and the managerial attitudes associated with management" (Acosta, 2009, p. 11).

This should lead us to consider that the principal is (or should be) a determining factor in influencing the improvement of underperforming students. This can be achieved thanks to his pedagogical profile, his possibilities of effective communication and his interpersonal skills to meet with parents and with teachers in general. In addition, it must have the ability to manage the acquisition of new equipment, as well as to promote training courses for teachers, research projects, cultural, sports and social activities, etc.

For this reason, Leithwood (1994, cited by Vázquez, 2013) points out that the effects of principals' leadership explain (directly and indirectly) 25% of school achievement. In fact, according to the same author, school leadership would be the second most important variable in student learning, which in some way is reflected in the present research. That is, we have found that the variables with the greatest contribution to the differences between the high and low performance groups were the organization of work meetings, teacher training courses, concern for the state of the campus infrastructure, as well as for the salary. This coincides with the findings of Bravo and Verdugo (2007) and Murillo and Krichesky (2012), who point out that principals are perceived by teachers as great and influential leaders.

Now, within the discriminant analysis between principals, the variables with the greatest contribution to the differences between the high and low performance groups were those of organizing meetings and courses (with and for teachers), dedicating time and effort to improve the conditions of work. the infrastructure (outside the possibilities of the assigned budget), as well as the prompt, effective and efficient attention of the problems that daily appear in the schools. This shows us that the actions that remain in their action radius can contribute to the generation of high-achieving students. Everything else (that is, the decisions and actions that are defined by the central administrations) contribute nothing to the above. Therefore, it would be interesting to provide a certain level of autonomy to the principals to decide what is relevant in the learning, because in this way it could be estimated to what extent these actions contribute to the improvement of student performance.

Conclusions

It is concluded that the principal is the school actor with the greatest power to improve the academic achievement of high school students, although it should be noted that his performance is highly influenced by the characteristics of his school team and especially by his teachers. In effect, the principal configures some school variables that affect the teacher's response to the search for didactic options and educational materials. For this reason, he must collectively integrate his entire team in activities for the development of academic competencies. The perception of capacity as a group is a highly influential variable in teaching performance, so the director must make a special effort to improve the confidence of teachers as a team to achieve academic objectives.

The results, in short, indicate that the directors of upper secondary education should take a more active role, since without their support and guidance, teachers will hardly be able to structure school environments that allow the formation of individuals capable of showing basic academic mathematics competencies , Spanish and science, as well as those required to live together and participate in the improvement of a democratic society.

Future lines of research and limitations

A future line of research should focus on the use of a mixed methodology. For example, if you want to study the phenomenon of academic achievement from a school perspective, it is important to listen to the voices of other informants, such as teachers, students, etc. On the other hand, it is recommended to continue studying the relationship between leadership and managerial support, and its impact on academic achievement, since it has been perceived that only the actions that remain within its scope are those that effectively contribute to the generation of students with high performance

Likewise, a longitudinal investigation is recommended to know the meaning of the relationships. Likewise, the reproduction of this model is suggested from a multilevel analysis where collective variables are distinguished from individual variables, as this would allow identifying which type of variable has the greatest impact on academic and social behavior competencies (Morgeson and Hofman, 1999). It is necessary to consider that the measurement of variables that inquire about the director-subordinate relationship will work better on a personal level than on a global level, since they will be influenced by the personal experience of each individual with the director (Choi et al., 2003).

Regarding the limitations of this work, those related to the use of self-report can be mentioned, which is the most used in school evaluations and results in high social desirability (Lillehoj, Griffin and Spoth, 2004). Another limitation was that it only worked with principals, so students and teachers should be included in future inquiries (Bauman and Del Río, 2005).

Finally, it should be emphasized that few studies have addressed the phenomenon of student achievement from the perspective of managers. Lastly, the cross-section used did not allow establishing the order of causality between the variables, therefore the understanding of the behavior of the school variables included in the present study was limited.

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Rol de Contribución	Autor (es)
Conceptualización	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Metodología	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Software	No aplica
Validación	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Análisis Formal	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Investigación	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Recursos	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Curación de datos	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual)
Escritura - Preparación del borrador original	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual) Jose Alberto Fraijo Figueroa (igual)
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Supervisión	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual) Jose Alberto Fraijo Figueroa (igual)
Administración de Proyectos	Jose ángel vera noriega (igual) Luis Enrique Fierros Dávila (igual) Jose Alberto Fraijo Figueroa (igual)
Adquisición de fondos	Jose Angel vera Noriega