

## Who are the Students who Aspire to be Teachers in Israel? Insights from PISA Tests<sup>1</sup>

- Studies indicate a correlation between the achievements of students who aspire to be teachers in their adulthood and the achievements of their countries in international exams.
- In Israel, the teaching profession's status is low in an international comparison, making it difficult to attract highly skilled people to the education system. An international comparison of the achievements of students who aspire to be teachers as adults shows that in Israel these students have a lower level of achievement than most of their counterparts in OECD countries.
- In order to attract more quality people to the education system, efforts must be made to improve the working conditions of the teaching staff and the prestige of the teaching profession as seen by the public.
- Recommended steps include: Increasing the autonomy of teachers and administrators, raising the salaries of beginning teachers, and adding pay components that are based on achievement, on specialization in scarce professions and on teaching in disadvantaged schools, and working to improve teachers' physical work conditions. This is in addition to changes in the education system itself, which will make it possible to identify successful teachers according to their contribution and to incentivize them.

Improving student achievement is a challenge facing many countries, and some policy documents have emphasized that improving the quality of the teachers is the best policy step toward achieving this goal. These statements are both from an international perspective and from an analysis adapted to Israel.<sup>2</sup> The importance of good teachers is again high on the agenda in view of several studies, whose main conclusion was that “smarter teachers produce smarter students”.<sup>3</sup> Today, recruiting good teachers, especially in the StEM fields (science, technology, engineering and mathematics), is a major challenge facing many educational systems around the world.<sup>4</sup>

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<sup>2</sup> OECD (2018), *Effective Teacher Policies: Insights from PISA*, PISA, OECD Publishing. Bank of Israel Annual Report for 2017, chapter 1.

<sup>3</sup> E. Hanushek, M. Piopiunik and S. Wiederhold (2014). *The Value of Smarter Teachers: International Evidence on Teacher Cognitive Skills and Student Performance* (NEBR Working Paper Series). Cambridge, MA: National Bureau of Economic Research. E. C. Meroni., E. Vera-Toscano and P. Costa (2015). Can low skill teachers make good students? Empirical evidence from PIAAC and PISA. *Journal of Policy Modeling*, 37(2), 308–323.

<sup>4</sup> A. Schleicher (2012). Building a high-quality teaching profession. Lessons from around the world. *Educational Studies* (1), 74–92. A. Schleicher (2012,B). *Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*. OECD Publishing. H. E. Price and K. Weatherby (2018). The Global Teaching Profession: How Treating Teachers as Knowledge Workers Improves the Esteem of the Teaching Profession. *School Effectiveness and School Improvement*, 29(1), 113–149.

The question of how better teachers can be recruited has not been evaded in Israel, where student achievement is low compared to OECD countries, and teachers' "level of proficiency" in relation to the population is low compared to the corresponding ratio in OECD countries.<sup>5</sup> In recent years, several reforms aimed at attracting high-quality personnel to the profession were carried out, and yet there is no improvement in indicators that measure the relative quality of new teachers entering the system.<sup>6</sup>

In this box, we examine who the boys and girls are who aspire to be teachers and their achievements in PISA tests in Israel and in OECD countries. The relevance of the analysis relies on the relationship between students' employment expectations and their future career choices (see Box 1 for further information): Many of the students who aspire at present to be teachers are likely to be the teachers of the future.

The analysis is based on the analysis of the answers to the question "What kind of job do you expect to have when you are about 30 years old?", which is repeated in several rounds of PISA tests. This question has been effective for a number of studies that have attempted to examine the causes of the difference in the number and level of achievements of students aspiring to engage in teaching in the future among the countries participating in the PISA tests, given the differences in the characteristics of the teaching profession among the various countries—wages, work hours, the public's perception of the profession<sup>7</sup> and various characteristics of the individual (gender, socioeconomic background and immigration).<sup>8</sup>

<sup>5</sup> **OECD (2019)**, *PISA 2018 Results (Volume I): What Students Know and Can Do*, PISA, OECD Publishing, Paris. Teacher proficiency level – A comparison of proficiency was carried out based on the PIAAC 2015 survey at both the median level and with the distribution of the teachers' median score compared to the population score, meaning that the teachers in Israel come from a lower proficiency cross section relative to the comparison countries: Bank of Israel Annual Report for 2018, chapter 6, Figures 6.13(a) and 6.13(b).

<sup>6</sup> Bank of Israel Annual Report for 2018, chapter 6, figure 6.14. Central Bureau of Statistics 2019, Academic and Pre-Academic Background among Teaching Staff, August 27, 2019.

<sup>7</sup> Wages were calculated as the statutory wages after 15 years compared to per capita GDP; work hours were calculated according to the total hours a teacher is required to teach in that country; the prestige of the profession was measured through answers from the TALIS survey, in which teachers answered how much the teaching profession is perceived as valued in their country and using the results of the Global Teacher Status Index.

<sup>8</sup> **H. Park and S. Y. Byun (2015)**. Why Some Countries Attract More High-Ability Young Students to Teaching: Cross-national Comparisons of Students' Expectation of Becoming a teacher. *Comparative Education Review*, 59(3), 523–549. **OECD (2018, B)**. "Who Aspires to a Career in Teaching?", in *Effective Teacher Policies: Insights from PISA*, OECD Publishing, Paris. **S. W. Han, F. Borgonovi and S. Guerriero (2018)**. What Motivates High School Students to Aspire to be Teachers? The Role of Salary, Working Conditions, and Societal Evaluations about Occupations in a Comparative Perspective. *American Educational Research Journal*, 55(1), 3–39. **S. Y. Tang, P. M. Wong, A. K. Wong and M. M. Cheng (2018)**. What Attracts Young People to become Teachers? A Comparative Study of Pre-service Student Teachers' Motivation to Become Teachers in Hong Kong and Macau. *Asia Pacific Education Review*, 19(3), 433–444.

### Box 1 – To what extent are the aspirations of 15-year olds aligned with their future career choice

Many studies have addressed the question as to the extent to which students' aspirations regarding their future career choice, especially in the context of teaching, are a prediction of their employment as adults. Some studies have found that career expectations have a strong impact on the beginning of teaching training<sup>1</sup>, and that youths decide on their choice of the teaching profession during their middle school studies and before graduating from school.<sup>2</sup> Several studies based on longitudinal surveys have found a connection between the individual's career aspirations as a youth and the actual career choice. According to these studies, aspirations regarding the occupational level (academic or professional) and the profession explain the future choice of profession better than the individual's other socioeconomic variables.<sup>3</sup> PISA data on student employment expectations have been used for a wide range of studies in the teaching profession and in the context of adapting youth employment expectations to the future employment world.<sup>4</sup>

The OECD Report (2018) presented two additional analyses that support the examination of the professional expectations of 15-year-old students with respect to the teaching profession. In the PISA teachers questionnaire, 62 percent of the young teachers stated that they chose the teaching profession during their high school studies, but the differences between countries are high (42–84 percent).<sup>5</sup> Another analysis presented in the report shows that the gap in scores between students who wish to be teachers and teachers of students who want to engage in another profession with similar education requirements is negative and greater in countries where the achievement in PISA tests is low and positive in countries where achievement is high.<sup>6</sup>

The figure shows the correlation between the achievement gap in the PISA 2006 test between students who were interested in teaching and students who were interested in pursuing another “profession” requiring an academic education<sup>7</sup>, and the proficiency gap measured in a population of young workers engaged in those professions in PIAAC 2015. The time difference between the test dates makes it possible to examine the same population group in the countries that took part in both tests and to ascertain whether there is a connection between the gaps measured in PISA and the proficiency gaps measured in the labor

<sup>1</sup> M. Aksu, C. E Demir, A. Daloglu, S. Yildirim and E. Kiraz (2010). Who are the Future Teachers in Turkey? Characteristics of Entering Student Teachers. *International Journal of Educational Development*, 30(1), 91–101. P. W. Richardson and H. M. Watt (2005). ‘I’ve Decided to Become a Teacher’: Influences on Career Change. *Teaching and Teacher Education*, 21(5), 475–489.

<sup>2</sup> In many countries, the formal education system ends at the age of 15, and then students must choose between the professional and academic tracks. J. Lee, S. Clery and J. Presley (2001). *Path to Teaching*, Illinois Education Research Council, Southern Illinois University.

<sup>3</sup> J. S. Ashby and I. Schoon (2010). Career Success: The Role of Teenage Career Aspirations, Ambition Value and Gender in Predicting Adult Social Status and Earnings. *Journal of Vocational Behavior*, 77(3), 350–360. Schoon, I., & Parsons, S. (2002). Teenage Aspirations for Future Careers and Occupational Outcomes. *Journal of Vocational Behavior*, 60(2), 262–288.

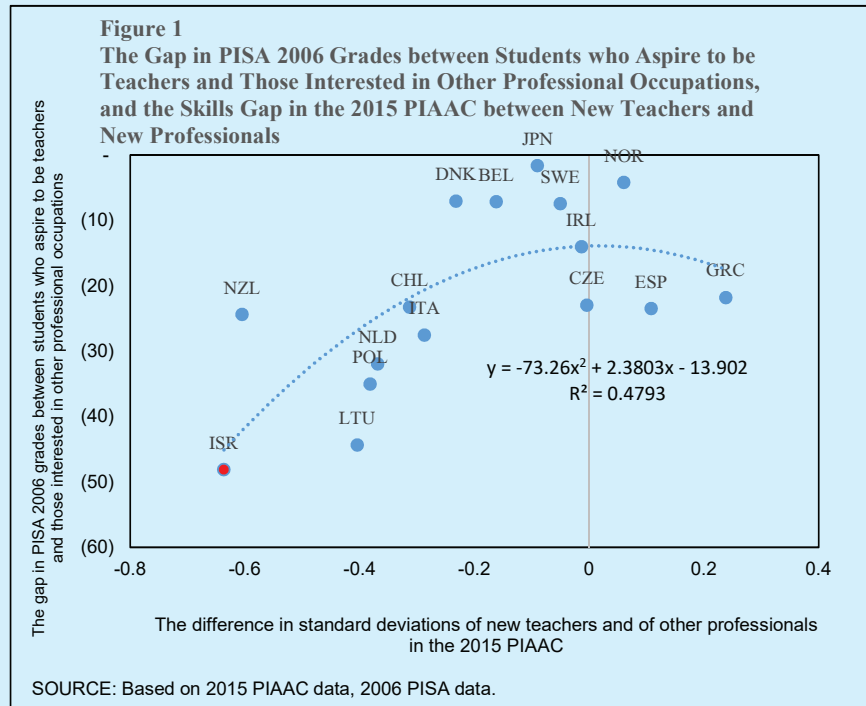
<sup>4</sup> A. Mann, V. Denis and A. Schleicher (2020). Dream Jobs?: Teenagers' Career Aspirations and the Future of Work.

<sup>5</sup> Teacher questionnaires are only filled out in some countries and not in Israel, and due to the great variation between countries and the difference in the transition between the studies and the labor market in Israel, these figures do not necessarily reflect the situation in Israel.

<sup>6</sup> OECD (2018). *Effective Teacher Policies: Insights from PISA*. OECD Publishing. Figure 1.3.

<sup>7</sup> Professions included in the professional classification are: scientific and engineering professions, medical, business, law and ICT professions.

market. The test results indicated a high correlation (0.6) between the achievement gap in math at age 15 and the proficiency gap in solving problems between teachers and other professionals among young workers with up to 5 years of professional experience.



The international comparison relates to two main metrics: 1. Number of Candidates Indicator—the proportion of students who wish to be teachers among the students who answered the question.<sup>9</sup> 2. Candidate Quality Indicator—The achievement gap in PISA tests between students interested in teaching and students interested in pursuing another profession<sup>10</sup>. Using this measure of the quality of candidates neutralizes the level differences between the countries and presents the relative achievement level picture of students interested in teaching in each country. Conclusions of the studies indicated a correlation between the relative wages and the number of students aspiring

<sup>9</sup> Table 4.6 of the OECD 2018, B sets out the scope of responses to the question in the various rounds of testing and in the different countries. In 2006, Israel stood out with a low rate of response to the question, and in 2015 and 2018, the response rate in Israel was higher than the average in the OECD countries.

<sup>10</sup> In professions with an entrance threshold of an academic degree, the breakdown of the professions is according to the classification of a professional worker in ISCO 08 for the data of 2015 and 2018 and ISCO 88 for the 2006 data.

to be teachers but not necessarily between the salary and the quality of the candidates. Additionally, in some studies, there is a positive correlation between the status of teachers and the working conditions of the teaching staff (work hours, professional autonomy, etc.) and the attraction of strong students to the teaching profession.<sup>11</sup>

Comparing these metrics between Israel and the OECD countries<sup>12</sup> may provide insights into the status of the teaching profession in Israel and its trends during the period under review, during which the "Ofek Hadash" (New Horizon) and "Oz Le'Tmura" (Courage to Change) reforms were implemented in Israel with the aim of improving the attractiveness of the teaching profession and attracting high-quality people.<sup>13</sup>

Figure 1.1 shows that the proportion of students interested in teaching in Israel is similar to that in the OECD countries (an insignificant gap), but the dynamics over time are different. In 2006, the proportion of students who were interested in becoming teachers in other OECD countries was higher than in Israel (5.5 percent versus 4.2 percent, significant) and has been declining since then, while there has been no significant change in Israel over the period. It is possible that the reforms in the education system, which, among other things, have increased teachers' monthly wages, have contributed to stability in the proportion of students who aspire to become teachers (an increase of 0.2 percent, not significant), in contrast to the decline in the OECD countries (1.4 percent, significant). An examination of the gender difference reveals that in Israel, like in the OECD, more girls than boys aspire to be teachers (6.7 percent among girls compared to approximately 3.0 percent among boys), but in both gender groups the rate in Israel is higher than the OECD average (5.8 percent among girls and 2.7 percent among boys).

An examination of the achievement gap in all disciplines (reading, mathematics and science) between the students who wish to become teachers and those who are interested in "other professions" revealed that it is one of the highest in the OECD countries (Figures 1.2 and 1.3), at the three points in time examined (Figure 2.1). Figure 2.2 shows the difference in the gaps between 2006 and 2018. During the period, the achievement gap in Israel narrowed slightly, but not at a rate that changed its low ranking.

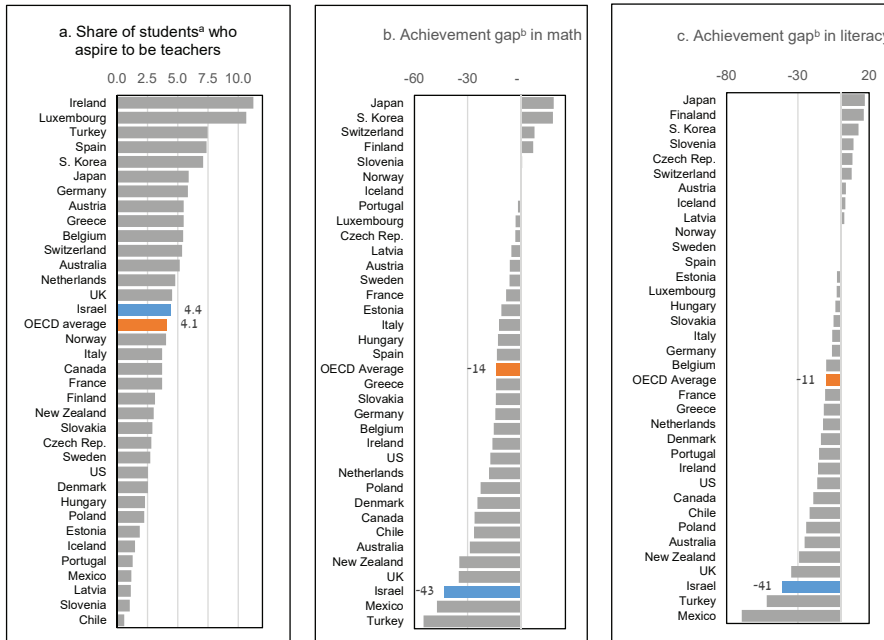
An examination of the background characteristics of students who wish to become teachers indicates that in Israel they come from a lower socioeconomic status than their counterparts in the OECD (significant). Figure 2.3 presents the difference in the proportion of students who wish to be teachers between those whose parents have an

<sup>11</sup> Strong students were defined as students in the top third of the achievements in that country. These students were more influenced by the public perception of the profession and the work hours. A graphical description of the relationships can be seen in OECD (2018, B) Figure 4.7, based on a sample of the OECD countries in terms of both the number of candidates and the achievements in mathematics.

<sup>12</sup> Because we want to examine the development of the data over time, the comparisons relate to the 35 OECD countries that took part in the three rounds of the test, even if during some of the specified period, they were not OECD members.

<sup>13</sup> The attraction of higher-quality people to the teaching profession can come from more talented students in the training institutions and by attracting older people in professional retraining tracks.

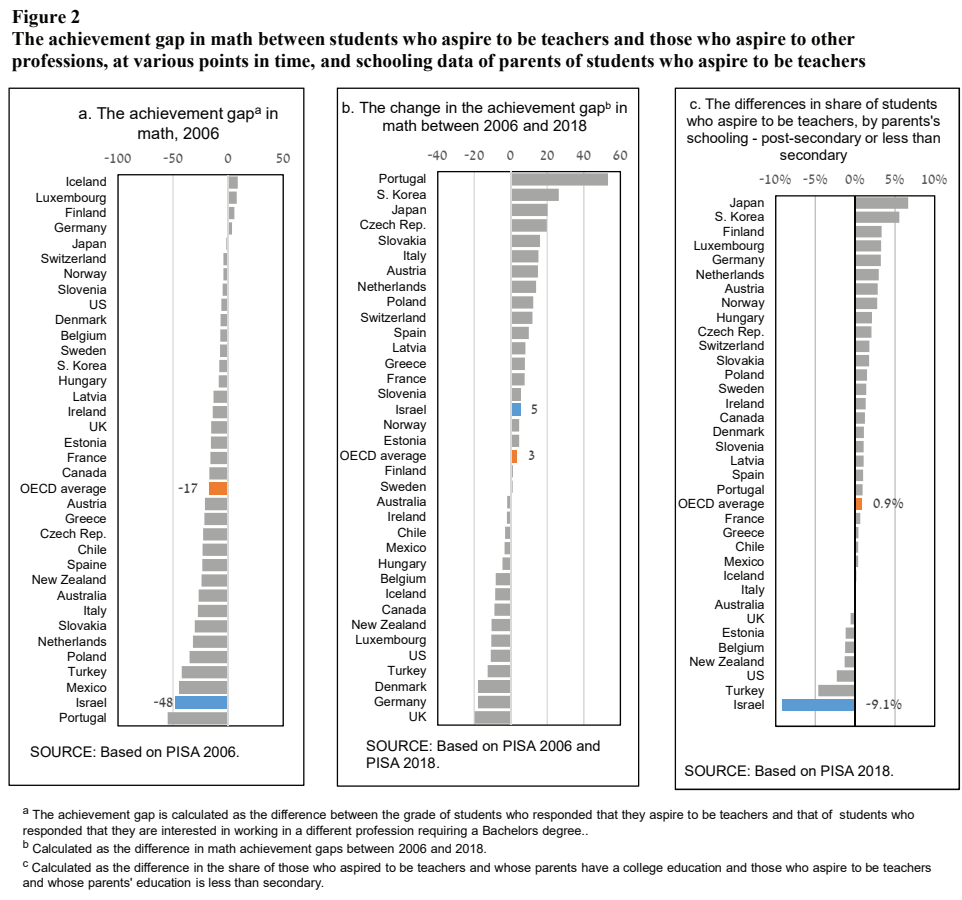
**Figure 1**  
**PISA 2018 Data on the Share of Students who Aspire to be Teachers and the Achievement Gaps in Math and Literacy among Students who Aspire to be Teachers and Those Who Want to Work in a Different Profession, 2019**



<sup>a</sup> Percentage of students who responded that they are interested in being teachers, relative to all respondents.  
<sup>b</sup> The achievement gap is calculated as the difference between the grade of students who responded that they aspire to be teachers and that of students who responded that they are interested in working in a different profession requiring a Bachelors degree.

SOURCE: Based on PISA 2018.

academic education and those whose parents have a lower than high school education. This comparison enables us to see for which students the teaching profession is perceived to be more attractive. The figure shows that in most OECD countries, the teaching profession is seen as more attractive among students of parents with an academic education (4.2 percent compared to 3.3 percent, a significant gap), while in Israel the teaching profession is perceived as more attractive among students of parents with less than a high school education (12.4 percent compared to 3.3 percent among those with an academic education, a significant gap).

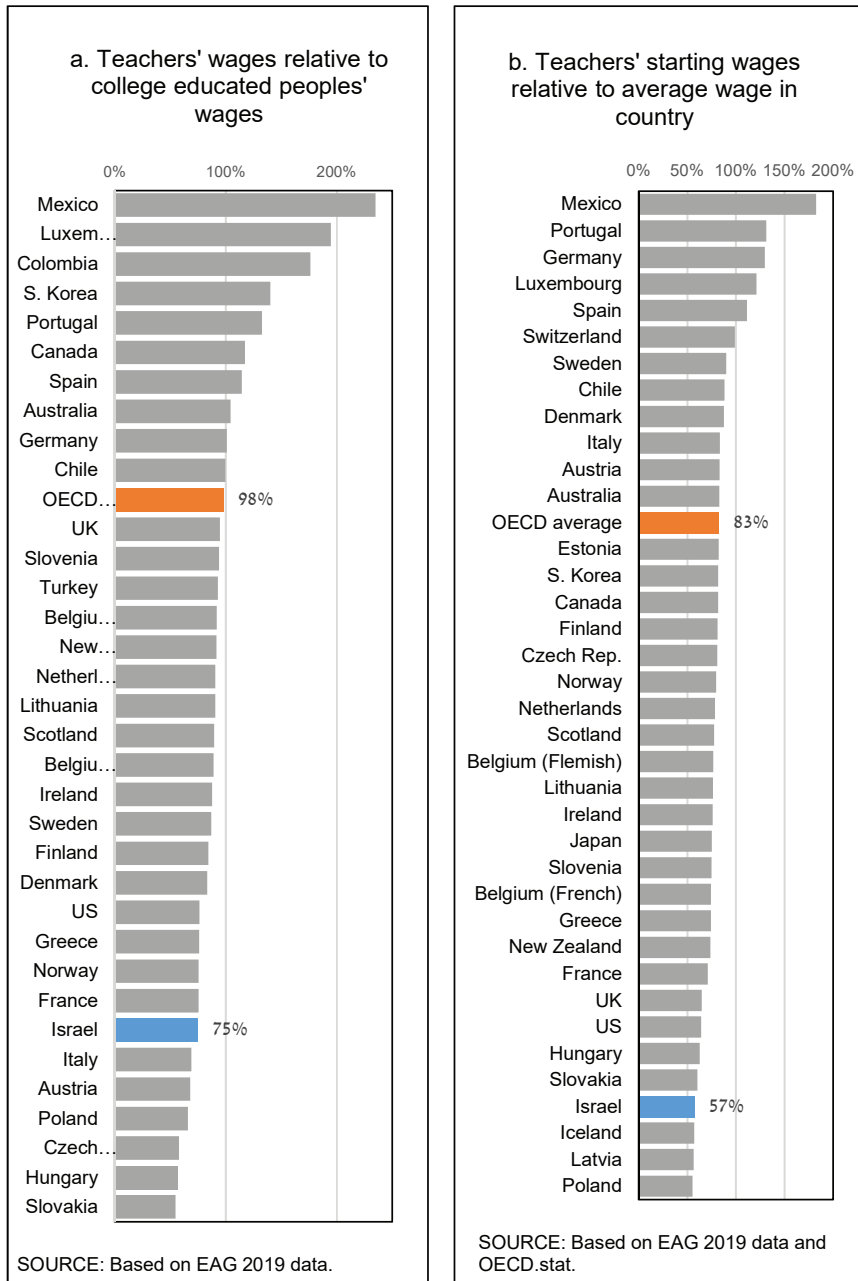


Another test examined the effect of the student's background characteristics on the desire to be a teacher at age 30 using a probability model (Logit) estimated for each of the OECD countries.<sup>14</sup> It was found that in Israel, a student's desire to be a teacher at 30 is more affected by socioeconomic status than in most OECD countries: In Israel, an increase in socioeconomic level significantly reduces the likelihood that a student will want to become a teacher, while in most OECD countries this effect was not found. This result remained the same at the three points in time examined.

One possible explanation for the great difference between Israel and the OECD countries in the socioeconomic status of those who aspire to be teachers is the variation among the population groups in Israel in relation to the teaching profession. The probability model estimation of Israeli data only, with a dummy variable for students in the State-Religious, State-Arab and Ultra-Orthodox education systems,

<sup>14</sup> The regression model is the reproduction of Table 4.8 from "Effective Teacher Policies: Insights from PISA" for the years 2006, 2015 and 2018. The variables included are: sex, immigration, mother tongue different from test language, socioeconomic indicator, mathematics score, reading score, whether one parent is a teacher and the school's socioeconomic average.

**Figure 3**  
**Data on salary of teachers in various stages of their career**





revealed that the probability of students in these systems wanting to be teachers is significantly greater than students in the State-Hebrew system.

Table 1 shows the proportion of students who aspire to become teachers in the two major education systems (State-Hebrew and State-Arab). The proportion of teachers in the working-age population is approximately 2.5 percent in Israel.<sup>15</sup> The table shows that most of the students who aspire to be teachers in Israel come from the State-Arab education system (42 percent of those who responded that they want to be teachers, well above their proportion in the study population – approximately 23 percent). This education system already has an excess supply of teachers (approximately 10,000 qualified teachers who are not employed, and every year the number of new qualified teachers exceeds the number of those employed), which results in low prospects for employment. The table shows that most of the students who aspire to be teachers in Israel come from the State-Arab education system (42 percent of those who responded that they want to be teachers, well above their proportion in the study population – approximately 23 percent).

**Table 1**  
**Percentage of students who aspire to be teachers, by education system, over time**

Education system	2006	2015	2018
State-Hebrew	0.9%	1.0%	0.9%
State-Arab	9.0%	<b>10.9%</b>	<b>8.7%</b>
Total Israel	4.2%	<b>4.9%</b>	<b>4.4%</b>

A statistically significant difference is shown in bold. The analysis does not include State-Religious or ultra-Orthodox school systems due to a small number of observations and large variance in the share of respondents between periods.

After reviewing the characteristics of the students who aspire to become teachers in Israel, we will try to relate the findings to the transformations that have occurred in the teaching profession in Israel and to previous studies on the subject. The lack of improvement in the relative quality of students wishing to become teachers (Figure 2.2), despite the implementation of the reforms, is consistent with findings from previous studies (Han et al., 2018), which have shown that an increase in the relative wages mainly affects the desire of the weaker students to enter the profession, while strong students are mainly influenced by the prestige of the profession and by employment conditions.<sup>16</sup> The main reforms in Israel raised the monthly salaries of the teaching staff, but increased the number of working hours, so that the hourly

<sup>15</sup> The Number of Teaching Employees by Supervision: Central Bureau of Statistics, 2019 Statistical Yearbook, Table 4.33.

<sup>16</sup> Strong students were defined as students in the top third of the achievements in that country, and weak students were defined as students in the bottom third of the achievements in that country.

wages of the teachers hardly changed. Comparing the wages of teachers with those of all Bachelor's degree graduates between Israel and the OECD countries shows that even after the reforms, the wages in Israel are lower than in the comparison countries (Figure 3.1).<sup>17</sup> According to research by Hanushek and others (Hanushek et al., 2014) in countries where teachers' wages are high relative to those of other Bachelor's degree graduates, the teachers' skills are higher, as are the students' achievements in PISA tests.

Another factor that correlates with the attraction of good applicants to the teaching profession is the starting wage.<sup>18</sup> Figure 3.2 shows a comparison of full-time starting wages in relation to the country's average starting wages and Israel's low ranking in this indicator. Israel's low position does not change even when the comparison focuses on the wages of academics aged 25–35: In Israel, teachers' salaries are approximately 68 percent of that of the comparison group, while the average in the other countries is approximately 87 percent.<sup>19</sup> In addition, in Israel, approximately 60 percent of beginning teachers are employed in a part-time position, compared to approximately 25 percent of beginning teachers in the 30 OECD countries that participated in TALIS 2018—a gap that is expected to increase pay gap between new teachers in Israel.<sup>20</sup>

Another reason that is found in the literature as attracting high-quality people to the teaching profession is the status of the teacher as perceived by the public. In Israel, the status of the teaching profession is low. Evidence of this can be found in the Global Teacher Status Index survey, a large-scale international survey that follows the teaching profession in 35 countries. In 2018, Israel's position according to this poll was the next to last, following the 2013 poll in which it was ranked last.<sup>21</sup> Similar results were also obtained in a survey that examined the attractiveness of the profession in Israel in relation to a series of professions.<sup>22</sup>

One of the explanations for the low status of the teaching profession in Israel is the great demand for teachers along with their relatively low wages. The low level of the actual wages is also influenced by the high proportion of part-time teachers

<sup>17</sup> Comparison of the statutory wage for a teacher with 15 years of seniority in a full-time position to the average salary of employees with an academic education. Education at a Glance 2019, Indicator D3, Table D3.2b.

<sup>18</sup> **McKinsey (2007)**, "On the Causes of the Success of the World's Best Education Systems", *Hed Hachinuch Publications*, translated from English Y. Farkash.

<sup>19</sup> This comparison was made in conjunction with the 2015 PIAAC data for 19 OECD countries, which included wage data, Bank of Israel processing.

<sup>20</sup> Source: TALIS 2018 individual data, Bank of Israel processing. Part-time employment is less than 90 percent of the position. Due to a low number of observations for teachers who began teaching in Israel that year, a beginning teacher was defined as a teacher whose seniority in teaching is up to one year.

<sup>21</sup> The survey was conducted among 1,000 respondents and included questions on many topics; including: status of the profession as seen by the public, what do people think are teachers' wages and work hours, what are the proper wages for teachers as seen by the public, does the public trust the teachers as an educator, how many parents will encourage their children to become teachers, students' assessment of teachers and more. Using the PCA method, the various answers were weighted into one index, which is meant to represent the attractiveness of the teaching profession in an international comparison.

<sup>22</sup> **J. Gilat, and N. Wongrowitz (2018)**. The Status of Teachers in Israeli Society Today. *Pages*, 11–27.68.

compared to the average position rate in the OECD<sup>23</sup>. The shortage of teachers results in a lowering of the conditions for employment and the recruitment of less qualified staff, thereby eroding the status of the teacher, which can lead to negative feedback and long-term harm to the status of the teacher. According to the State Comptroller's Report (2019), the shortage of teachers has continued for almost a decade, and in some stages of education there is, according to the comptroller, a "loose connection" between the teacher's training and the profession he teaches.<sup>24</sup> Reinforcement of these findings can also be found in PISA 2018 data, which show that in Israel, the rate of unqualified teachers is higher than in most OECD countries.<sup>25</sup>

The findings presented in this box illustrate the need for attracting quality people to the teaching profession. Recommendations of this kind have been expressed in a number of public committees that have dealt with the education system in Israel (the Guri Committee, 1960; the Etzioni Commission, 1979; the Dovrat Committee, 2005), in many policy documents by leading education researchers<sup>26</sup>, and more recently in a special report by the Bank of Israel Research Department dealing with productivity in the economy.<sup>27</sup> The Productivity Report included a series of practical recommendations for improving the quality of the teaching, including recommendations for increasing the autonomy of teachers and administrators, raising the salaries of beginning teachers and adding pay components that are based on achievement, on specialization in scarce professions and on teaching in disadvantaged schools, and improving the teachers' physical work conditions. This is in addition to changes in the education system itself, which will make it possible to identify successful teachers according to their contribution and to incentivize them.

<sup>23</sup> According to TALIS 2018 data, approximately 70 percent of teachers in Israel are employed full-time, compared with approximately 84 percent in the 30 OECD countries that took part in the survey. The gap in position rates is expected to lead to an upward bias in Israel's data. The position rate gap also leads to the bias of the "actual wage" figure published by the OECD, as it is calculated only on a full-time teacher basis, which leads to a bias due to the high correlation between position rates and seniority rates in Israel, with the average seniority of a full-time teacher in Israel being 17.15 compared to approx. 15.4 in the OECD countries.

<sup>24</sup> **State Comptroller (2019)**. Annual Report 96b, Ministry of Education, Teaching Personnel – Planning, Training and Placement.

<sup>25</sup> **OECD (2019)**. PISA (2018). Results (Volume II): Where All Students Can Succeed, PISA, OECD Publishing, Paris. Table II.B1.5.3 Fully certified teachers, by school characteristics.

<sup>26</sup> "Fateful Search: Israeli Society is Seeking Good Teachers", *A Collection of Articles*, edited by Drora Kfir, Mofet Institute 2011. M. Ben-Peretz (2009). Position paper on the topic: The Teacher's Status: *New Directions*, Haifa University. N. Blass (2009). Improving the Attractiveness of the Teaching Profession, A Review Commissioned as Background Material for the Work of the Expert Team "Who will Learn when Teachers are Lacking".

<sup>27</sup> Special Report of the Research Division: Raising the Standard of Living in Israel by Increasing Labor Productivity, August 2019.