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LITERATURE REVIEW AND POLICY DIRECTIONS**

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Teacher Quality: Literature Review and Policy Directions

Yael Navon and Yossi Shavit *

Abstract

Research indicates the importance of teachers in impacting their pupils' achievements. However, the specific teacher characteristics that affect achievements are not known. Thus, it is unclear how to improve the quality of teachers. Some suggest changes in the selection criteria of teachers; others believe that pay incentives would motivate skilled teachers to enter and remain in the profession. Studies of the effectiveness of economic incentives on teacher efficacy yield mixed results. Israeli studies indicate the positive influence of individual and group economic incentives on student achievement in the matriculation exams. In contrast, studies in other countries have found that economic incentives do not have a significant influence on pupil achievement. In the past decade the education system in Israel has undergone two reforms – Ofek Hadash and Oz LeTemurah. The reforms include, amongst other things, incentives by way of a salary rise, performance-based bonuses and new career ladders. These reforms included promising components as well as possible pitfalls that are discussed in the paper. Finally, there is a call for an evaluation of these programs in an attempt to assess the impact of their components on pupil achievement and on teacher motivation, morale and performance.

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The main determinant of the educational success of young people is family background, in particular parental education and economic status. Since policymakers' ability to influence family background is complex and often very limited, education policies tend to focus on systemic variables that affect educational achievement. Understanding the effects of systemic features, among them teacher quality, is thus highly valuable.

1. The Importance of Good Teachers

Researchers generally agree that teachers are an important, and perhaps the most important, systemic factor in education. The 2007 McKinsey Report identified three variables common to education systems with high-achieving pupils, two of which – teacher recruitment and training – are related to teacher quality (Barber and Mourshed 2007). Studies using the currently accepted method of fixed effects models also indicate that teachers are an important variable in pupil achievement. Studies of this type examine the variance in achievement among otherwise comparable pupil groups taught by different teachers (e.g., different classes at the same school). These studies assess the extent to which particular teachers can affect pupil achievement, controlling for a variety of other factors relevant to achievement. Input, in the form of teacher quality, is usually measured in terms of achievement units, enabling researchers to assess teacher effectiveness in improving pupil achievement. These studies have consistently found a significant effect of the teacher on pupil achievement (or on changes in achievement over time)¹ as well as a great deal of variance in teacher quality.² In other words, these studies indicate that particular

¹ Models that examine incremental achievement or control for past achievement are termed value-added models.

² It should be noted that these studies face significant methodological challenges in inferring causality. One of the major challenges is the non-random assignment of teachers and pupils to classes and schools by geographical area, school type, etc. When placement is not random, the models must distinguish the influence of teachers (i.e., the causal relationship between teacher quality and pupil

teachers could have a major influence on pupil achievement.³ Some of the studies have compared the effect of the teacher to the effects of the school or class size and have found the influence of the former to be more important (Luyten 2003⁴; Nye, Konstantopoulos, and Hedges 2004; Rivkin, Hanushek, and Kain 2005; Buddin and Zamarro 2009; Sanders, Wright, and Horn 1997; Nye, Konstantopoulos, and Hedges 2004; Rivkin, Hanushek, and Kain 2005; Hanushek 2011).⁵

The implication suggested by these findings is that pupil achievement can be enhanced by improving teacher quality, and this might be more significant than the improvement found by making other systemic improvements. It is worth noting that improved pupil achievements have both social and economic value. Hanushek (2011) has studied the hidden economic value of teacher quality, both in terms of the financial reward for education in the labor market and in terms of the relationship between improved cognitive skills in the population and national economic growth.

achievement) and the influence of other differences between pupils. The most common method of dealing with this challenge is by means of adding fixed-effects coefficients for the pupils or the school to the model. Inferring causality is further complicated by omitted environmental effects, biases due to the achievement indices used, and more (Koedel and Betts 2010; Papay 2011).

- ³ The educational outcome examined by most studies is grades, both because grades are easy to measure and because improving them is considered one of the education system's primary objectives. Other educational outcomes have been examined, however. For example, Jennings and DiPrete (2010) have found evidence that teachers' influence on social and behavioral development is comparable in magnitude to their influence on academic achievement, while Koedel (2008) has found teachers to have a significant effect on drop-out rates.
- ⁴ Luyten's (2003) review shows opposite cases as well, where the strength of the influence of the school was found to be greater than that of the teacher, especially when teacher influence was measured by the difference between parallel classes (same school, same grade, same course of study). Levitan therefore concludes that the teacher is not necessarily a more important determinant of pupil achievement than other school factors.
- ⁵ The comparison is generally to reducing the class size to a certain number of pupils; the studies that are cited compare when class size is reduced by a significant number of approximately ten pupils.

His calculations show that bringing United States pupil achievement on international tests up to Finnish levels by improving teacher quality would have increased United States GDP by no less than \$112 trillion.

Findings also indicate that to the extent that there is a correlation between teacher quality (in terms of effectiveness) and pupils' socioeconomic background, this is likely to exacerbate class inequality in education. In order to decrease the inequality caused by family background, education policymakers can direct teachers identified as effective to schools and classes with a high concentration of pupils from socioeconomically underprivileged backgrounds.⁶

2. Can Good Teachers Be Identified?

In light of these findings, one would expect education systems to devote a great deal of attention to improving teacher quality. Achieving such an improvement is far from simple, however. The main difficulty is that although it is clear *ex post facto* that good teachers can improve their pupils' achievements, identifying such teachers in advance proves to be a difficult task. Moreover, although many researchers have aimed to identify the characteristics of good, achievement-improving teachers, these factors have yet to be identified with any precision. Numerous researchers have looked for statistical relations between pupil achievement and observed teacher characteristics, such as education, seniority and gender. Others have searched for relations between various teacher characteristics and teacher

⁶ It is important to note, however, that the success of teacher quality in decreasing inequality depends on the degree to which improved achievements persist over time, i.e., on the extent to which teachers' influence is long- rather than short-term, though the findings about this latter aspect are inconclusive (Sander and Rivers 1996; Kane and Staiger 2008; Rothstein 2010). Likewise, the possibility of narrowing gaps also depends on the effectiveness of teachers being similar for pupils of different social standing. Here, too, the findings are not conclusive (Sanders and Rivers 1996; Sander, Wright, and Horn 1997; Aaronson, Barrow, and Sander 2007; Slater, Davies, and Burgess 2009).

effectiveness as defined by fixed effects models. Despite these efforts, findings have been scant, pointing to no strong and consistent correlations between observed teacher characteristics and pupil achievement. Moreover, more researchers agree that the characteristics identified so far explain a very small part of the variance in teacher quality (Nye, Konstantopoulos, and Hedges 2004; Aaronson, Barrow, and Sander 2007; Buddin and Zamarro 2009; Leigh 2010).⁷ Interestingly, only a few studies have systematically explored teacher personality traits in the context of pupil achievement (Blass 2008).⁸

One of the only teacher characteristics with a consistent correlation to pupil achievement is teacher experience (Greenwald, Hedges, and Laine 1996; Nye, Konstantopoulos, and Hedges 2004; Rivkin, Hanushek, and Kain 2005; Clotfelter, Ladd, and Vigdor 2006; Clotfelter, Ladd, and Vigdor 2007; Croninger et al. 2007; Buddin and Zamarro 2009; Harris and Sass 2009; Leigh 2010; Hanushek 2011). Nevertheless, numerous findings indicate that the correlation is weak and nonlinear, and sometimes disappears after the first few years of teaching (Clotfelter, Ladd, and Vigdor 2006; Clotfelter, Ladd, and Vigdor 2007; Buddin and Zamarro 2009; Slater, Davies, and Burgess 2009; Leigh 2010; Hanushek 2011; Harris and Sass 2011).

Findings regarding the effects of other teacher characteristics on student achievement have been even less consistent. For example, most studies have found no consistent correlation between teacher education, irrespective

⁷ Clotfelter, Ladd, and Vigdor (2006) disagree, however, claiming that measurable features explain a large part of the overall influence of teacher quality.

⁸ In this context it is worth noting that teacher effectiveness has to do not only with teacher characteristics but also with teaching practices, or with what we shall term “teaching quality” (as opposed to “teacher quality”), or what Cruickshank (1976) refers to as “process variables.” Numerous diverse studies have addressed teaching quality, and a deeper understanding of the effects on pupil achievement is likely to help policymakers design effective teacher training and professional development programs.

of the measure used, and pupil achievement or improvement⁹ (Nye, Konstantopoulos, and Hedges, 2004; Rivkin, Hanushek, and Kain 2005; Clotfelter, Ladd, and Vigdor 2006; Xu and Gulosino 2006; Clotfelter, Ladd, and Vigdor 2007; Croninger et al. 2007; Buddin and Zamarro 2009; Hanushek 2011; Harris and Sass 2011; Harris and Sass 2011). The few studies that have focused on teachers' specific field of study have shown contradictory findings (Dee and Cohodes 2008; Metzler and Woessmann 2010). Only a handful of studies have examined the relation between teacher effectiveness and licensing test scores. Here, again, the findings are not consistent (Clotfelter, Ladd, and Vigdor 2007; Buddin and Zamarro 2009). The same is the case regarding the findings on the influence of different types of teacher certification (Clotfelter, Ladd, and Vigdor 2007; Croninger et al. 2007; Hanushek 2011; Harris and Sass 2009). The findings on the influence of innate characteristics are also not conclusive, although some studies have found female teachers to have a positive effect on pupil achievement compared with their male counterparts (Aronson, Barrow, and Sander 2007; Buddin and Zamarro 2009; Leigh 2010).

Studies that have looked at teacher personality characteristics examined personality differences between teachers (or student teachers) and the general population and the relationship between teacher characteristics and teacher quality as evaluated by principal and pupil evaluations, researchers' observations and training grades. Due to the complexity and varying definitions of the concept of personality, it is difficult to draw a clear line

⁹ Though no relation has been found between teacher education and pupil scores, studies have provided evidence for a positive relation between teacher education and pupil drop-out rates (Koedel 2008) and between teacher education and overall educational inequality (Montt 2011). Some studies measure teacher education as a dichotomous variable, where advanced degree holders are assigned the value "1." Though most studies have found no consistent relation between teacher education and pupil achievement, some findings do support such a relation. A test of statistical significance combining forty education coefficients from roughly twenty-five studies indicates that most of the available evidence supports a positive relation between teacher education and pupil achievement (Greenwald, Hedges, and Laine 1996).

between personality traits and other individual and teaching characteristics. Furthermore, the measures of these characteristics are many and varied. Among these are tests designed to identify various attitudes, values, areas of interest, needs, coping mechanisms, and latent personality traits, as well as projective tests, including verbal associations and the Rorschach test (Getzels and Jackson 1963). As noted, only a few studies have examined the relation between personality traits, as measured by various personality tests, and pupil achievement. Pupil improvement in reading and spelling is found to be correlated to teachers who are termed “self-controlled”¹⁰; and teachers who are termed “turbulent”¹¹ are found to have greater pupil improvement in mathematics and science (Heil and Washburne 1961). No significant correlation was found, however, between teacher extraversion and conscientiousness, as measured by a five-factor model (The Big Five), and pupil achievement in mathematics (Rockoff et al. 2008). It should be noted that Rockoff and his colleagues have found a significant positive correlation between pupil achievement in mathematics and factors based on a number of combined personality indices¹² (Rockoff et al. 2008); but since these factors have yet to be examined in further studies, no theoretical or practical conclusions can as yet be drawn.

In any event, the effects of teachers’ acquired characteristics, even those found to be significant, on pupil achievement are weak. The effect of teachers’ personality traits on pupil achievement have not been studied to an extent that would justify drawing conclusions.

¹⁰ These types showed a preference for questionnaire items that classified them as methodical, preoccupied with cleanliness and conscientiousness, and showed no affinity for items related to aggressiveness, impulsivity and humor.

¹¹ These types showed a preference for questionnaire items with more aggressiveness, impulsivity, and did not show an affinity for items related to cleanliness or conscientiousness.

¹² Rockoff et al. distinguish between two factors: “cognitive” and “non-cognitive” skills. Cognitive skills include accreditation, training institution selectivity, SAT scores, IQ, and math skills. Non-cognitive skills include extraversion, personal and general efficacy, commitment, and personality test scores.

It seems that if changes to the admissions criteria of teaching colleges or in the structure of economic incentives for teachers are based on the aforementioned observable characteristics, they should not be expected to result in considerable improvements in pupil achievement. Such steps may change the teacher population in terms of various characteristics and traits, but these do not seem to affect pupil achievement to any significant extent.

Nevertheless, although educational background and cognitive tests are not promising as predictors of teacher effectiveness, higher admissions and hiring requirements with respect to these indices may help improve the social status of the teaching profession, indirectly encouraging talented candidates to turn to teaching. One difficulty with this proposal, however, is that stricter requirements are unrealistic when the demand for teachers exceeds the supply of candidates. Along with stricter entrance requirements, the problem of supply must therefore be addressed by increasing the rewards associated with the teaching profession.

3. Using Value-Added Models to Improve Teacher Quality

The difficulty in identifying effective teachers in advance on the basis of observable characteristics has led Hanushek (1972, 2011) and others to propose the use of value-added models to identify such teachers. Value-added models are used to calculate changes in pupil achievement over the school year while controlling for other pupil characteristics. This model is suggested by researchers to help in identifying teachers who are clearly ineffective and to remove them from classes, and/or to use differential financial incentives to reward effective teachers.¹³ The use of value-added models thus sidesteps the need to identify characteristics predictive of

¹³ Performance-based salary is meant to improve teaching manpower in two ways: it provides an incentive for teachers to work harder to improve pupil achievement, and it also encourages effective teachers to remain in the teaching profession (Buddin and Zamarro 2009).

teacher effectiveness in advance, making it possible to improve the quality of teaching staff after the fact.

The use of value-added evaluations is problematic in several respects, though. First, since rewarding and promoting the right teachers requires ongoing efforts to evaluate teacher effectiveness, many resources must be invested in frequent and comprehensive data gathering. Second, teachers evaluated solely on the basis of their individual accomplishments might neglect collective efforts requiring teamwork. Third, teachers fearful of losing their jobs due to low effectiveness might gear their teaching toward high evaluation scores, to the exclusion of other important teaching objectives. Fourth, teacher evaluations are marred by various methodological biases, including failure to take into account the differences in pupil populations. For example, the model's failure to control for pupils based on non-observed characteristics is bound to penalize teachers assigned to classes or schools with difficult pupil populations and to reward teachers in less difficult ones (Hanushek et al. 2010). Fifth, teacher unions may resist the removal of ineffective teachers (unless done in very small numbers) as well as the introduction of differential performance-based compensation, as labor unions usually prefer worker compensation to be based primarily on seniority, training, and rank rather than on performance.

4. Incentives

Proposals to use value-added models as a basis for firing, promotion and compensation are based, among other things, on the assumption that incentives may improve teacher quality. There are several recognized incentive routes, including: salary raises or bonuses based on individual performance, group bonuses based on collective performance, developing career ladders that enable promotions on the basis of relevant criteria, and mentoring programs. The use of incentives involves several important distinctions. First, it is important to distinguish between internal and external incentives, where the former includes personal satisfaction which

may be based on the perception of one's work as meaningful or important, positive interactions in the workplace, a sense of self-fulfillment, etc. External incentives involve rewards from one's environment, material or non-material, such as status, prestige, work conditions, and financial rewards. Policy cannot provide internal incentives directly, but it can create the conditions that foster them. There is also a distinction between individual incentives given on the basis of individual performance, and group incentives given on the basis of collective performance. All the programs noted previously offer external incentives in the form of money, status, and recognition, but the relative weight of each differs with each incentive program. Programs offering differential performance-based salaries (both individually and collectively) focus on financial rewards, usually accompanied by status. Career ladders and mentoring programs emphasize status, sometimes accompanied by financial rewards. The nature of the external reward (material or non-material) and the identity of its recipients (individuals or groups) affect the ability of policy to encourage internal rewards.

Should external incentives be used, and if so, when? According to general principal-agent theory, when agents, in this case, teachers, are motivated by internal rewards and altruism, no external rewards are necessary. The theory acknowledges, however, that agents are motivated by a variety of incentives, and that the preference of agents for different incentives is not uniform. It is thus probable that external rewards are also needed to improve teacher effectiveness. The effectiveness of such incentives depends on labor market structure, in particular, on the extent to which teachers and principals have access to information on the correlation between effort and outcomes.¹⁴ In cases of information asymmetry, when managers have access to relatively limited information, resource-intensive evaluation and monitoring systems must be developed in order to ensure the effectiveness of financial incentives. Moreover, the use of financial rewards

¹⁴ "Managers," according to this theory, are those who demand and pay for the outcomes. In the case of education there are multiple managers, including parents, pupils, the Ministry of Education, taxpayers, and school principals.

as incentives, particularly for internally- motivated workers, may actually impair both effort and outcomes (Levaččić 2009). Finally, external rewards that damage internal motivations may also harm efforts to improve teacher quality in the long term by attracting less suitable candidates. Since any desirable policy must focus on long- as well as short-term teacher quality, it is important to weigh carefully incentive programs that not only do not damage internal motivations but that work to foster them.

Studies on the influence of economic incentives on teacher effectiveness have yielded conflicting results. Some have found such incentives to promote teacher quality (Eberts, Hollenbeck, and Stone 2002; Lavy 2002; Figlio and Kenny 2007; Lavy 2009). In Israel, Lavy (2009) found individual incentives to have a positive effect on pupils' matriculation test-taking rates, average matriculation scores, and matriculation eligibility rates. He also found group incentives at the school level to have a positive effect on average matriculation exam scores, the average number of matriculation units per pupil, the average number of matriculation units per pupil in the sciences, and pupil drop-out rates between lower and upper secondary school (Lavy 2002). Examining some of the possible side effects, Lavy found no evidence that individual incentives caused teachers to manipulate pupil grades or to orient their teaching to success in incentive-related evaluations. These findings give the impression that individual or group incentive programs can yield desirable results. Several limitations give reason for caution, however. Lavy's research time frames were short (only one or two years); his studies focused exclusively on upper secondary school pupils and matriculation outcomes; and the schools examined were unrepresentative of Israeli high schools in several important respects.¹⁵ Due to these limitations, Lavy's conclusions must be considered with caution, and the research should be expanded to encompass additional contexts and performance indices over longer periods of time. Furthermore, in light of

¹⁵ The individual incentive program was examined in schools where matriculation eligibility rates were equal to or lower than the national average, while the group incentive program was examined primarily in schools serving small communities.

the theory, future studies should examine the effects of external incentive programs on internal incentives and on success in attracting suitable candidates to the teaching profession.

Standing in sharp contrast to Lavy's findings are the rather pessimistic conclusions of a National Research Council report on the use of incentives in education (Hout and Elliott 2011). This prestigious report raises serious doubts concerning the efficacy of financial incentives in improving teacher quality. In this thorough survey of the literature on incentives for both teachers and pupils, the authors show that the use of material incentives leads to negligible or no improvement in pupil achievement, and that what little improvement is made tends to be concentrated in tests where teachers are both interested in and capable of inflating pupils' grades in order to bias their own evaluation results. One of the authors' chief conclusions is that programs designed to improve teacher quality should offer teachers professional support alongside, or as part of, their incentive programs. Such support is especially important given the fact that low-performing populations (ineffective teachers or schools) are often also those lacking the ability to improve on their own.

As already noted, training and professional development are mentioned in several McKinsey reports among the features common to successful and improved education systems (Barber and Mourshed 2007; Mourshed et al. 2010). Many studies examine the perceptions of teachers and lecturers in training programs and the effectiveness of these programs, although only a handful of studies have examined the influence of these programs on the success and effectiveness of teachers in practice. Among the few that have are several American studies on non-traditional training programs such as the Teach for America program which recruits outstanding students from elite universities and assigns them to difficult-to-staff schools. While the studies indicate positive outcomes in terms of pupil achievement (Hanushek 2011), such improvements are not necessarily the result of training methods. Finnish studies have noted the requirement of professional training and mandatory Masters' studies as factors attracting young Finns to the teaching profession (Toom et al. 2010). Since there is little evidence of correlations

between observed teacher training characteristics and their effectiveness, one's view of how such training should be designed inevitably depends on the perception of the teachers' proper role and requisite professional skills, and is thus a function of policies in other areas. The view of teachers as professionals who are required to have theoretical and practical knowledge as well as decision-making skills or, alternatively, as skilled workers who carry out decisions has implications on the type of training required as well as on the criteria for lecturers in training programs (Townsend 2011).

Professional development, training, and support can help introduce external incentives without stifling internal ones. Without proper training and support, some teachers may react to performance-based incentives with despair or low motivation for improvement. Firestone and Pennell (1993) suggest that work conditions, including autonomy, a variety of required skills, task-oriented identification with the overall work process, involvement in decision making, cooperation, learning opportunities, and resources, contribute to some extent to commitment among workers in general and among teachers in particular. There is some evidence that instituting career ladders may promote commitment, as may group incentives, especially ones responsive to teamwork and learning opportunities (Firestone and Pennell 1993). By contrast, individual incentives might promote competitiveness, which could harm teamwork, cooperation and learning opportunities (Duttweiler 1988; Firestone and Pennell 1993).

As well as performance-based incentive, material external incentives include universal compensation in the form of base pay. According to the 2010 McKinsey Report, one of six features common to education systems that have managed to improve their achievement levels is appropriate compensation for teachers and administrators, including reasonable base pay relative to GDP per capita (Mourshed et al. 2010). Studies in the United States have shown that low pay discourages good students from entering the teaching profession and prevents good teachers from remaining (Temin 2002). Temin further claims that under certain circumstances due to market conditions, base pay should be raised above a minimum threshold; reforms

that do not include base-pay raises or raises that are insufficient cannot hope to improve the quality of teachers. In many developed countries, the relative pay of primary school teachers fell in the second half of the twentieth century (Lakdawalla 2006). In some countries, however (including Finland, ranking first in pupil scores on international tests), teachers' pay, although not particularly high, is higher than GDP per capita. In Israel, by contrast, teachers' pay was 60 to 70 percent of GDP per capita before, and 80 percent, by some assessments after implementation of the *Ofek Hadash* program (Nathan 2006; Nathanson and Tzameret-Kercher 2009).

5. *The Situation in Israel*

Some of the policy proposals noted in the current review of the literature and certain of the features mentioned in the McKinsey Reports have already been implemented in Israel over the past decade. The *Meitzav* (School Effectiveness and Growth Indices) tests were introduced a decade ago to assess pupil achievement, and in the last five years two major teacher-centered reforms were introduced and implemented: *Ofek Hadash* ("New Horizon") in primary and lower secondary schools, and *Oz LeTemurah* ("Courage to Change") in upper secondary schools.

The new reforms included raising teachers' base pay while increasing their number of at-school work hours, defining career ladders based on seniority, professional development and supervisor evaluations, and encouraging teachers to take up other non-instructional duties. The *Oz LeTemurah* program also introduced performance-based individual and group bonuses. Both programs included teacher evaluations, although at this point only *Ofek Hadash* has built a detailed evaluation tool based on the combined and collaborative input of supervisors, administrators, teachers, and principals with an agreed upon definition of a "good teacher." The tool's strengths include diverse outcome indices reflecting the complexities of teaching. In addition, the tool offers detailed indices and more than one evaluation method, including principal observations, self-evaluation and

evaluation by other relevant parties. The tool was developed through the collaboration of relevant parties and includes teachers in the feedback process as well as in the goal setting for improving teaching (Beller 2012).

The literature surveyed reinforces the sense that these reforms hold considerable promise for improving teacher quality and the level of teaching. Israel's education system now faces the task of stabilizing and institutionalizing these reforms while continuing to examine their effectiveness, and at the same time responding to criticism and considering possible improvements. Implementation of these reforms, especially *Oz LeTemurah* is still in its early stages; their short- and long-term results should be monitored to find which of their features should be preserved and which may be improved, omitted, or added. To this end, it is important to continue to invest in creating pupil achievement databases (such as *Meitzav*) and to ensure that they are accessible to educators and researchers, both as evaluation tools for assessing current conditions and trends, and as one measure of the success of the reforms.

In addition, as already noted, mentoring and guidance initiatives can help minimize the potentially negative side-effects of evaluation and incentive programs (Duttweiler 1988). Efforts should therefore be devoted to certain aspects of professional development and systemic institutional support. In this context, *Meitzav* data may be helpful in directing systemic support to the schools that need it.

Several central aspects of the reforms merit reexamination. First, there is a need to examine teacher's current base pay relative to GDP and to other market salaries. Second, the effectiveness of additional teacher work-hours – the target of much recent criticism – should be subjected to further scrutiny; these additional hours, some claim, place an unwarranted burden on teachers and principals, damaging their work conditions and professional commitment. Third, the effectiveness of the incentive mechanisms contained in the reforms, including career ladders and individual and group bonuses, should be further examined. While some studies support these mechanisms' effectiveness, possible disadvantages should also be considered, among them the negative effects of competitive bonuses on

collaboration and teamwork and adverse effects on work conditions and commitment. Fourth, attention should be devoted to implementing the evaluation program and combining it with suitable training and professional development policies. Despite its previously noted advantages, there are certain possible flaws to the teacher evaluation tool of the *Ofek Hadash* program, which merit further consideration, such as its overreliance on principals as single evaluators. A recent paper on the evaluation program proposes adding other evaluation tools like portfolios on teachers' work and perceptions, as well as examining the relationship between teacher evaluations and further opportunities for professional development (Hartaf, Ratner-Avrahami, and Beller 2011).

Evaluation programs, competent and thorough as they may be, are insufficient catalysts of improvement. For this, it is important to combine a process of evaluation with professional development and support for teachers (Hartaf, Ratner-Avrahami, and Beller 2011; Hout and Elliott 2011).

Finally, in addition to the proposed examination of the reforms' effectiveness through pupil achievement, resources should be allocated to an examination of entrance into the teaching profession over time – both quantitatively, in terms of the number of candidates, and qualitatively, in terms of candidates' personal characteristics. An increase in the number of candidates would make possible the examination of new selection mechanisms like demonstration classes and group evaluation, and their implementation and support in continued and long-term improvement.

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