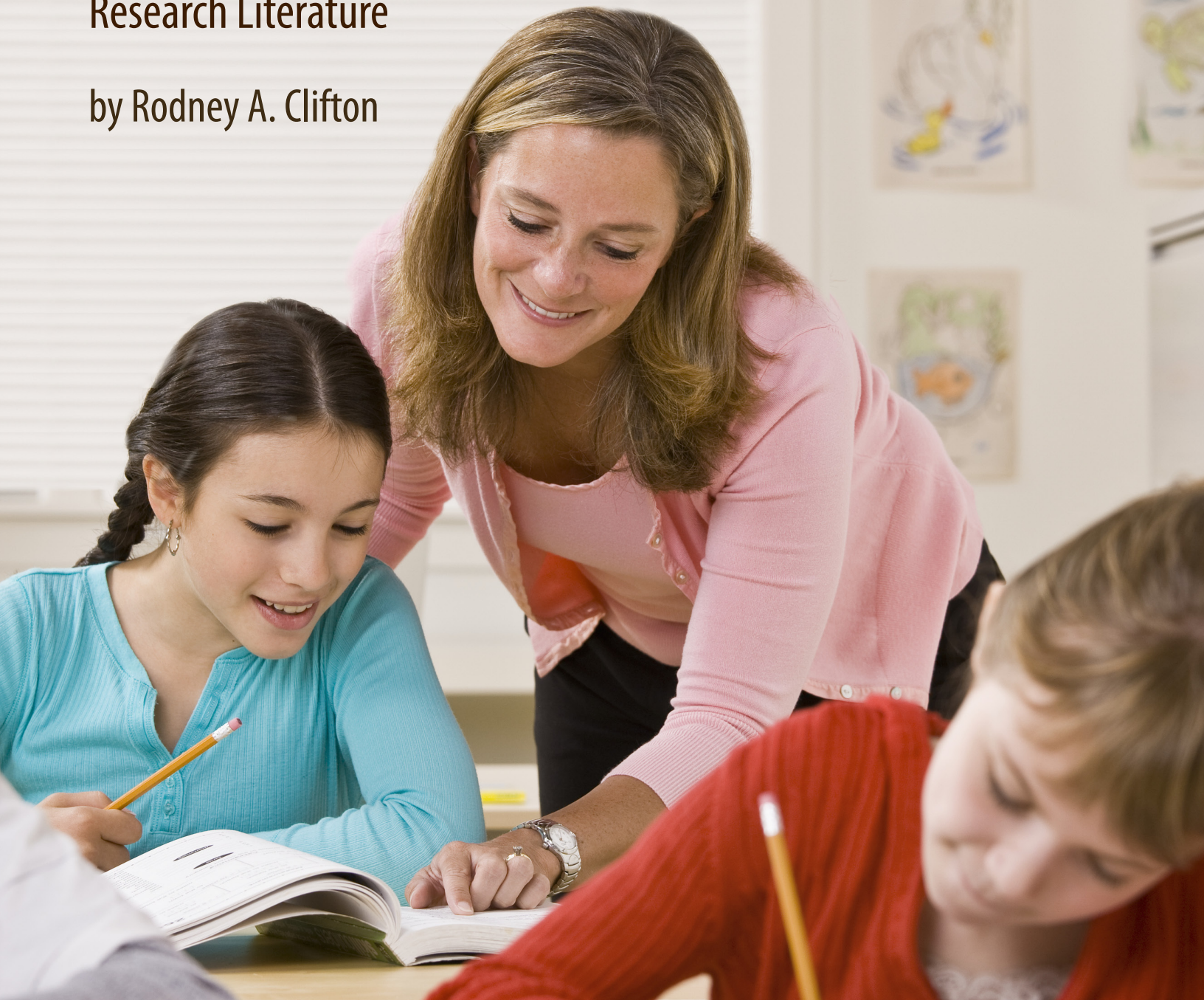




Obtaining Better Teachers for Canadian Public Schools: A review of the “Teacher Effectiveness” Research Literature

September 2013

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Executive summary

The quality of education that students receive in public schools is becoming an increasing concern for parents, taxpayers, politicians, and business leaders. These stakeholders are asking for greater accountability as measured by actual results rather than by input and process variables. In response, researchers have recently measured the effects of numerous teacher variables on student knowledge and skills.

This paper reviews the literature on teacher education, certification, and hiring, showing that there are great differences in the effectiveness of teachers in public schools. Better teachers are not necessarily those with more education and more experience, the two traditional variables used when determining salaries. The paper recommends new policies that will potentially enhance the impact that teachers and school administrators have on the academic achievement of public school students.

Introduction

In both Canada and the United States, the quality of education that students receive in public schools is becoming a concern for parents, taxpayers, politicians, and business leaders (Chubb, 2012; Saha & Dworkin, 2009; Winters, 2012). Not surprisingly, parents realize that the quality of their children's education directly affects their future employment, and their social and financial success. In turn, politicians and business leaders understand that the quality of education that students receive has substantial effects on the future economic and political viability of provinces, territories, states, and countries (see for example Laidler, 2002; MetLife, 2012).

These stakeholders have increasingly asked for greater educational accountability often measured by results on standardized tests rather than by input and process variables, such as the amount of money spent on schools, the number of students in a classroom, the education level of teachers, or their teaching experiences. Over the last two decades the increased use of high-quality standardized achievement tests, Programme of International Student Assessment (PISA), and Trends in International Mathematics and Science Study (TIMSS) for example, allowed stakeholders to directly compare student achievement across schools, districts (or divisions), provinces and territories, states, and, indeed, across countries (Dworkin, 2009; Hattie, 2009; Saha & Dworkin, 2009; Winters, 2012).

In addition, a number of studies have examined the effects of teacher and school variables on students' knowledge and skills. This paper reviews the research literature on what is known as "teacher effectiveness". The literature shows that there are substantial differences in the effectiveness of teachers, but the procedures now used by school districts for hiring excellent teachers have not been very successful in identifying

or paying them. This review assesses the policies that are presently used and recommends new policies that are more likely to reward effective teachers who actually improve the academic achievement of students who attend public schools.

Teachers' post-secondary education, experience, and compensation

Public school teachers are paid on the basis of salary schedules that differ across school districts and provinces. In fact, all Canadian public school districts use salary schedules that pay teachers based on their years of post-secondary education and their years of teaching experience (Canadian Education Statistics Council, 2012: 87-92), and almost all public school districts in the United States use similar salary schedules to pay teachers (Podgursky & Springer, 2011).

As an example of the way teachers are paid, table 1 reports the 2012-13 salary schedule for teachers in the Winnipeg School Division #1, the largest division in Manitoba (the Winnipeg School Division and the Winnipeg Teachers' Association, 2010). As noted, the schedule shows that teachers' salaries increase based on only two variables: their years of teaching experience (columns), which range from zero to nine years, and their post-secondary education (rows) indicated by "class", which range from three to seven.

The salary schedule published by the Winnipeg School Division #1 includes Classes 1 and 2, but the salaries of teachers in these two classes are not reported because there are very few teachers in these two classes. Class 3 represents teachers with three years in a post-secondary degree program with at least one year of professional course work; Class 4 represents teachers with four years in a degree program, and so on (see the Winnipeg School Division and the Winnipeg Teachers' Association, 2010: 5-12).

This table shows that teachers with more experience and more education receive higher salaries than teachers with less experience and less education. Specifically, teachers in Class 7 earn about 20 percent more than teachers in Class 4 with the same teaching experience. Moreover, teachers with nine years of experience earn slightly over 50 percent more than teachers in the same class with no experience. In addition to the increases in salaries based

on this schedule, the Collective Agreement between the teachers' association and the school division increases salaries for all teachers by two percent in each of the 2011-12, 2012-13, and 2013-14 school years.

Table 1: The salary schedule for teachers in the Winnipeg School Division #1, 2012-2013

Years of teaching experience	Class 3	Class 4	Class 5	Class 6	Class 7
0	\$41,722	\$50,249	\$53,871	\$57,046	\$60,375
1	\$43,693	\$52,651	\$56,277	\$59,969	\$62,735
2	\$45,416	\$55,520	\$59,157	\$62,851	\$65,642
3	\$48,177	\$58,409	\$62,035	\$65,727	\$68,988
4	\$51,070	\$61,371	\$65,006	\$68,631	\$72,511
5	\$53,962	\$64,415	\$68,040	\$71,868	\$76,025
6	\$59,074	\$67,457	\$71,082	\$75,265	\$79,539
7		\$70,498	\$74,131	\$78,657	\$83,091
8		\$73,192	\$77,258	\$82,046	\$86,652
9		\$77,586	\$81,915	\$86,841	\$91,469

Source: The Winnipeg School Division #1 and the Winnipeg Teachers' Association (2010): 7.

Table 2: Percentage increases in salaries for teachers in the Winnipeg School Division #1 as a result of teaching experiences, 2012 - 2013

Increases in teaching experience	Class 3	Class 4	Class 5	Class 6	Class 7
0 to 1 year	4.7%	4.8%	4.5%	5.1%	3.9%
1 to 2 years	3.9%	5.4%	5.1%	4.8%	4.6%
2 to 3 years	6.1%	5.2%	4.9%	4.6%	5.1%
3 to 4 years	6.0%	5.1%	4.8%	4.4%	5.1%
4 to 5 years	5.7%	5.0%	4.7%	4.7%	4.8%
5 to 6 years	9.5%	4.7%	4.5%	4.7%	4.6%
6 to 7 years		4.5%	4.3%	4.5%	4.5%
7 to 8 years		3.8%	4.2%	4.3%	4.3%
8 to 9 years		6.0%	6.0%	5.8%	5.6%

Source: Author's calculations.

Table 3: Percentage increases in salaries for teachers in the Winnipeg School Division #1 as a result of changing classes, 2012 - 2013

Years of teaching experience	Class 3 to 4	Class 4 to 5	Class 5 to 6	Class 6 to 7
0	20.4%	7.2%	5.9%	5.8%
1	20.5%	6.9%	6.6%	4.6%
2	22.2%	6.6%	6.2%	4.4%
3	21.2%	6.2%	6.0%	5.0%
4	20.2%	5.9%	5.6%	5.7%
5	19.4%	5.6%	5.6%	5.8%
6	14.2%	5.4%	5.9%	5.7%
7		5.2%	6.1%	5.6%
8		5.6%	6.2%	5.6%
9		5.6%	6.0%	5.3%

Source: Author's calculations.

Table 2 reports the effect of increasing teachers' years of experience within each class. Here, we see that each year of experience increases teachers' salaries by between 3.8 percent for Class 4 teachers who increase their experience from seven to eight years and 9.5 percent for Class 3 teachers who increase their experience from five to six years. Overall, there is considerable variability, with no discernible trend, in the salary increases that result from teaching experience for teachers with less than nine years of teaching experience.

For example, without any change in class level, the salary of a Class 5 teacher with no experience will increase by 6.5 percent (2 percent plus 4.5 percent), and the salary of the a Class 6 teacher with five years of experience will increase by 6.7 percent (2 percent plus 4.7 percent). Thus, in 2013-14 the salary of the first teacher will be \$57,373, and the salary of the second teacher will be \$76,683 (the Winnipeg School Division and the Winnipeg Teachers' Association, 2010: 7-8). The schedule also implies that teachers with nine or more years of teaching experience will only receive the standard 2 percent increase unless they change their class by obtaining more post-secondary education.

Table 3 reports the effects on teachers' salaries for those who increase their education level, and thus their class from Class 3 to 4, Class 4 to 5, etc. The largest increase is for teachers in Class 3 to move to Class 4. Specifically, Class 4 teachers with no experience make 20.4 percent more than Class 3 teachers with no experience. Obviously, the collective agreement means that both the school division and the professional association agree that substantial

incentives are needed so that teachers with three years of post-secondary education increase their education level. But, teachers who move from Class 4 to 5, Class 5 to 6, or Class 6 to 7 increase their salaries by between 4.4 and 7.2 percent in addition to the 2 percent increase that all teachers receive. This table illustrates there is considerable variability, with no discernible trend, in the salary increases that result from post-secondary education for teachers with four to seven years of education.

Paying teachers on salary schedules that includes post-secondary education and teaching experience means that teachers with more education and more experience are paid more than teachers with less education and less experience even if they are doing the same job and even if the lower-paid teachers do a better job than the higher-paid teachers. This means that there is a strong incentive for teachers to increase their class level by completing additional post-secondary courses. In the Winnipeg School Division #1, however, incentives for teachers are particularly strong for teachers with three years of post-secondary education to increase their education to at least four years (Winters, 2012: 70).

Underlying salary schedules such as this one is the assumption that teachers improve their teaching performance with increased post-secondary education, at least between three and seven years, and with increased experience, at least up to nine years. Even though this assumption has not been examined in Canada, it has been examined in the United States as illustrated below.

The literature on teachers' effectiveness

Since 1983, when *A Nation at Risk* was published in the United States, there has been considerable concern and spirited debates over policies designed to increase the educational performances of public school students, particularly students in poor schools (National Commission on Excellence in Education). This debate included a great number of national and state organizations, the National Council on Teaching and America's Future, the National Board for Professional Teaching Standards, the National Council for the Accreditation of Teacher, Teach for America (founded by Wendy Kopp), and the New Teacher Project (founded by Michelle Rhee), along with virtually every major American think-tank.

Many of these organizations have produced reports on ways to improve the performance of students (see for example, Chubb, 2005 & 2012; Darling-Hammond, & Baratz-Snowden, 2005: 5-28; Hess, Rotherham, & Walsh, 2004). All of the reports substantially agree on at least one finding: there is "... ample evidence that the assumed relationship between [teachers'] credentials, experience, and effectiveness is wrong" (Winters, 2012: 71).

For example, the empirical research by Kane, Rockoff, and Striger (2008) show that there is little evidence that increasing the number of courses teachers take in their education programs, as they are now structured, or the number of years teachers have been teaching significantly improves their students' academic performances (see also Aaronson, Barrow, & Sanders, 2007; Chubb, 2012; Rivkin, Hanushek, & Kain, 2005). Nevertheless, a number of research studies show that first-year teachers are considerably less effective than more experienced teachers. In other words, many teachers become much more effective during their first and second years of teaching (see Aaronson, Barrow, & Sanders, 2007; Chubb, 2012; Hanushek, Kane, O'Brien, & Rivkin, 2005; Kane, Rockoff, & Staiger, 2008; Podgursky & Springer, 2011: 168; Rivkin, Hanushek, & Kain, 2005). Consequently, a number of researchers have suggested that if policy makers are concerned about improvements to student academic achievement, they should focus on paying teachers on the basis of that achievement rather than on their own post-secondary education and teaching experience, except, of course, for their first few years when they are becoming more effective (see, for example, Ballou, 2001; Barlevy, & Neal, 2012; Belfield & Heywood, 2008; Goldhaber, DeArmod, Player, & Choi, 2008).

Factors that affect students' academic achievement

Recently Zwaagstra, Clifton, and Long (2010: 4-5) noted that with 60 or 70 variables included in the thousands of statistical studies that attempt to explain the academic achievement of students, no more than 35 percent of the total variance has been accounted for. In other words, about 65 percent of the variance in the achievement of students remains unexplained, suggesting that this variance is composed of truly individual variation between students and measurement error.

Nevertheless, a meticulous meta-analysis of the extant research literature shows that four types of variables affect students' academic achievement (see Hattie, 2009):

- 1** The students themselves: their socioeconomic status, motivation, interests in school, and a number of related variables account for about 50 percent of the explained variance (and about 17.5 percent of the total variance).
- 2** The teachers' classroom activities: on-task time, organization, assigned homework, and a number of related variables account for about 30 percent of the explained variance (and about 10.5 percent of the total variance).
- 3** The students' home environment: the intellectual discussions students have with their parents, the support their parents provide for educational activities, such as going to libraries and museums, and a number of related

variables account for about 10 percent of the explained variance (and about 3.5 percent of the total variance).

4 The school resources: finances per student, class size, building quality, and a number of related variables account for about 10 percent of the explained variance (and about 3.5 percent of the total variance).

Hattie's (2009) careful review of a great many studies shows that the behaviour of teachers in their classrooms has substantial effects on their students' academic achievement, explaining about 30 percent of the explained variance and over 10 percent of the total variance, when a number of other important variables are controlled (see also Chubb, 2012; Winters, 2012).

In turn, Rivkin, Hanushek, and Kain (2005) have shown that the best performing 15 to 25 percent of teachers are able to impart a year and a half's worth of material to students in one academic year, while the bottom 15 to 25 percent are only able to impart half a year of material to similar students. In other words, the best performing teachers are at least three times more effective than the worst performing teachers. This evidence suggests that excellent teachers can off-set the negative effects of many other variables including the students' socioeconomic status (see Bracey, 2004; Chubb, 2012; Ripley, 2010; Winters, 2012; Zwaagstra, 2013).

For this reason, policy makers have been increasingly concerned about selecting, retaining, compensating, and promoting effective teachers and keeping ineffective teachers out of public school classrooms (Imig, Koziol, Pilato, and Imig, 2009: 143).

Characteristics of effective teachers

In summarizing the research that examines the variables that affect the performances of students, Brophy (2006) and Good and Brophy (2008) show that at least five characteristics distinguish effective teachers from ineffective teachers (see also Chubb, 2012; Marzano, 2007; Schmoker, 2011; Winters, 2012; Zwaagstra, Clifton, & Long, 2010).

1 Effective teachers ensure that the curricula are coherent and consistently taught. They also ensure that the educational objectives are clearly identified and can be achieved. Effective teachers challenge their students, being neither too demanding nor too easy.

2 Effective teachers implement policies that are fair, clearly understood, and consistently enforced. Specifically, students, teachers, and parents understand, accept, and abide by these policies which focus on the students' behaviour and academic performances.

3 Students learn most efficiently when they are truly engaged with the material and when instructional time is not wasted. This is called “time on task,” and effective teachers do not waste time; rather, they engage their students in learning activities for a large proportion of the class time. In support, effective teachers assign homework when it is needed so that students practice and apply the knowledge and skills they have learned. As well, effective teachers mark assignments and return them in a timely manner so that students continually know how well they are doing and how they can improve.

4 Effective teachers are well-educated in the disciplines they teach. The comprehensive subject expertise of these teachers helps to engage students in critical and thoughtful elaborations, digressions, and debates. Effective teachers move beyond the basic level of knowing facts about the subject they are teaching to analyze, synthesize, and evaluate the material. In this way, effective teachers scaffold new evidence and concepts on the students’ present understanding of the subjects they are studying.

5 Effective teachers use a variety of valid and reliable ways of assessing their students’ understanding and skills so that they know what needs to be reviewed, retaught, and practiced in class and as homework. These teachers quickly identify the difficulties students have in understanding and applying the subject matter, and they quickly assign remediation to those who need it so they are quickly brought up to the expected level without undue frustration. Finally, they assess or reassess the students’ understanding to ensure that the material is well-understood before they move on to teach more complex material.

Of course, effective teachers also vary their teaching techniques depending on the students’ age, grade, abilities, learning characteristics, and the number of students in the classroom. Not surprisingly, this literature shows that the knowledge and skills necessary to be an effective teacher can be taught—and learned—in faculties of education. Unfortunately, as the research literature also suggests, many student teachers do not learn these principles and/or they fail to put them into practice in their teaching careers. But, teachers can only implement effective teaching strategies that they understand, and only when they have strong administrative and parental support for using effective strategies.

Recent reforms in teachers’ certification and compensation

In both Canada and the United States, provincial and state governments control the educational programs for teachers even though school boards hire the

new teachers and manage the local schools. Moreover, faculties of education deliver the courses, and most provincial, territorial, and state governments issue the teaching certificates (Bascia, 2009: 482). In Ontario, the College of Teachers, a professional association, issues teaching certificates.

Nevertheless, provincial and territorial governments, along with faculties of education, establish the basic requirements for the certification of teachers for the subjects (art, history, and math, for example) and grade level (early, middle, and senior years in some provinces, and primary, junior, intermediate, and senior in others) they are permitted to teach (Bascia, 2009: 482). Generally, teaching certificates are only valid within the province or territory in which they are issued, but there are interprovincial agreements allowing teachers to teach in other provinces.

These inter-provincial and territorial agreements have not addressed the effectiveness of teachers. Nevertheless, over the last fifty years or so, there have been three reforms directed at improving the effectiveness of teachers. Specifically, teachers' certification requirements have changed; certification examinations have been increasingly used; and some states in the US have experimented with certifying and paying teachers on the basis of their students' academic achievement. All of these reforms, however, have serious limitations.

Increasing post-secondary education requirements

Over time, the requirements for the certification of teachers have changed dramatically. In the early 1960s, when schools were built and expanded to educate more students, the children that resulted from the baby-boom, temporary teaching certificates were issued to student teachers who successfully completed one or two years of four year Bachelor of Education degrees. In order to receive permanent certificates, teachers were often required to teach successfully for a couple of years and to have their performance evaluated by principals, superintendents, and/or inspectors. As well, many practicing teachers continued taking post-secondary education courses, during night school and summer holidays, to complete their degrees.

Generally, in all provinces and territories student teachers are now required to complete at least a four year B.Ed. degree or a Bachelor of Arts, Bachelor of Science, or another acceptable degree, with one or two years in B.Ed. programs before they are certified to teach. In the Winnipeg School Division #1 (see table 1), beginner teachers holding B.Ed. degrees would have Class 4 teaching certificates and would receive a salary of \$50,249 for the 2012-13 year, and teachers holding B.A.s and two-year B.Ed.s would have Class 5 teaching certificates and would receive \$53,871.

The argument for increasing the educational requirement for teachers' certification is very simple: the best teachers are the best educated teachers.

This argument also underlies, in part, the payment schedules for teachers with considerable incentives for them to increase their post-secondary education (Sedlak, 1987). Simply stated, public school teachers who have more post-secondary education receive higher salaries in both Canada and the US, presumably because they are more effective than less well-educated teachers.

But, as already noted, increasing teachers' post-secondary education, and paying them higher salaries, does not substantially improve the academic performances of their students. As such, independently administered certification examinations have been tried as an additional way of improving the teaching performances of public school teachers.

Certification examinations

During the 1990s, a number of studies illustrated that teachers' verbal ability and subject matter expertise had relatively strong and positive effects on their students' academic achievement (see, for example, Chubb, 2012; Rivkin, Hanushek, & Kain, 2005; Winters, 2012). As a result, a number of states in the US and a few Canadian provinces, such as Ontario, began using screening examinations or interviews before aspiring teachers were admitted to faculties of education, and some states required aspiring teachers to pass certification examinations when they completed their teacher education programs. Surprisingly, no Canadian province or territory requires teachers to pass rigorous admission and/or certification examinations, even though reliable and valid examinations would both dissuade and disqualify weak candidates from becoming teachers (Hess, Rotherham, & Walsh, 2004).

At present, the Praxis examinations, developed and administered by the Educational Testing Service, have been used in most states in the US. Praxis I tests students on reading, writing, and mathematics and are required before aspiring teachers are admitted to faculties or schools of education. Praxis II is a certification exam that tests aspiring teachers' knowledge of teaching methodology and the subjects they aspire to teach. There are hundreds of Praxis II exams and teachers specializing in different subjects and grade levels are required to pass different tests established by the various departments of education. Finally, Praxis III is an applied certification examination taken during new teachers first years of teaching, ideally after they have spent a year or two in their own classrooms honing their skills. Specially trained assessors observe new teachers in their classrooms, assess them on standardized instruments, and interview them on their teaching strategies and methods. The reports are then given to the teachers and their school administrators.

But, as Kate Walsh (2004: 224) notes, the standards for passing these admission and certification exams are often very low:

While some teaching programs do not accept applicants who do not test at an eighth-grade level [in basic math and reading], many do. While the teacher candidate must take the course of studies required by the institution and the state, the coursework tends to be aimed at a low academic level because of the low academic level of most students in the program.

Essentially, these exams have been “dumbed down” presumably due to pressure from the various interest groups, teachers’ unions, faculties of education, and school boards (Foster, 2013; Imig, Koziol, Pilato, & Imig, 2009; Podgursky, 2004; West & Mykerezzi, 2011; Winters, 2012). Consequently, a number of states in the US have been experimenting with alternative methods of certification and teacher compensation. Specifically, some states have been measuring the achievement of students as a way of judging teachers’ competencies for certification and/or pay (Podgursky, 2004). These schemes are called merit pay or value-added compensation models.

Value-added compensation

Value-added models have developed because the extant compensation packages, as illustrated in table 1, have not been linked to student academic achievement (Winters, 2012: 72). Surprisingly, only a few experimental programs linking teachers’ compensation with their students’ performances have been implemented (Ballou, 2001; Chubb, 2012; Martin, 2010; Winters, 2012). None of these programs, however, take place in Canada (Barlevy & Neal, 2012; Belfield & Heywood, 2008; Martin, 2010; Muralidharan & Sundararaman, 2011).

Generally, in these studies students are assessed in core subject areas, specifically the English language and mathematics, at the beginning of the school year and then reassessed at year end. Their academic progress is recorded and teachers whose students made good progress receive merit pay. The research protocols claim that teachers who were ineffective over a couple of years would be required to complete retraining programs to maintain their teaching certificates. In reality, few, if any, teachers failed the recertification examinations.

Nevertheless, the value-added experiments showed that when the rewards for teachers were dependent on the students’ academic improvement, the students’ achievement actually increased, but only by a moderate amount (Muralidharan & Sundararaman, 2011). Some evidence suggests that merit pay schemes of about five or six percent of teachers’ annual salaries were sufficient for obtaining moderate improvements in student academic achievement (Belfield & Heywood, 2008; Muralidharan & Sundararaman, 2011).

Most of these merit-based schemes, however, have been discontinued after the experimental period (Belfield, & Heywood, 2008; Winters, 2012:

86-90). Five reasons for not paying or certifying teachers on the performances of their students have been put forward.

1 Eberts, Hollenbeck, and Stone (2002) showed that when merit payment rewarded individual teachers, other teachers in the same schools concluded that they were being treated unfairly (see also Belfield & Heywood, 2008; Winters, 2012: 46). Ballou (2001), specifically, noted that education is a cooperative endeavour in which teachers, counselors, principals, and many other professionals collaborate in helping students improve their academic achievement. Merit systems that reward individual language and math teachers, and not other teachers or administrators in the school, undermine the collaborative nature of education (Firestone & Pennell, 1993).

2 Teachers' unions have not supported merit pay systems because they create tension between teachers and these schemes make it difficult to administer collective agreements (Ballou, 2001; Goldhaber, DeArmod, Player, & Choi, 2008; West & Mykerezi, 2011).

3 Since some schools have high turn-over rates of students, it is difficult to credit specific teachers with the students' success, or more likely, with their failure.

4 Even when merit systems function effectively, they have been quite expensive to administer—five or six percent of the average salaries as merit awards and a couple of percent in administration costs—and the students' achievement gains have been quite modest (see Muralidharan & Sundararaman, 2011).

5 Some teachers and administrators have devised ways of receiving merit pay without actually improving their students' academic performance. These "professionals" have been able to "game the system" for their own advantages at the expense of both taxpayers and students (see Homstrom & Milgrom, 1991).¹

In part, because of these five objections, many policy makers have lost some of their initial enthusiasm for merit payment schemes for public school teachers. Nevertheless, this research still suggests ways to improve the academic success of students by changing both teachers' certification requirements and school districts' accountability systems.

1 In some schools, poor performing children were told not to come to school; in some schools, the teachers gave the students the correct answers for test questions; in others the superintendents gave the teachers the exam questions before the exam so they could teach the students.

Recommendations

James Heckman (1999: 100), a University of Chicago economist and a Nobel Laureate, said: “Public schools are local monopolies with few competitors. The problem in public education is primarily due to muted incentives, not to inadequate resources” (107). A researcher working at Friedman Foundation for Educational Choice goes so far as to say: that educational monopolies empower “a dense cluster of rapacious special interests [basically, teachers’ unions, school boards, and faculties of education] resisting all efforts to improve schools” (Foster, 2013: 28). Of course, changing the status quo is extremely difficult with the resistance of a number of powerful “rapacious” interest groups.

Nevertheless, there is little doubt that to improve the education of public school students, the way teachers are recruited, educated, certified, hired, and tenured must be changed. In particular, teachers must have relatively high verbal, numerical, and subject-matter knowledge and skills. Moreover, they must have incentives to work diligently at helping students achieve academically. School level administrators, in turn, must have incentives to help teachers teach the core subjects well and to help other school personnel make valuable contributions to the students’ academic achievement. Finally, the rewards for successfully improving the students’ academic achievement must be shared by all school personnel because they have all participated in the students’ education.

Five recommendations are proposed, in part, to constrain the power of the “rapacious special interests” groups (Foster, 2013) and to help improve the academic achievement of public school students.

Recommendation 1: *Assess the literacy and numeracy of student teachers*

Goldhaber and Anthony (2003) show that teachers with high verbal and mathematical ability and skills obtain better results from their students than teachers

with low ability and skills. Thus, entrance to teacher education programs must require aspiring teachers to pass high quality literacy and mathematical examinations, such as Praxis I. To remove this decision from the self-interest of faculties of education, teachers' unions, and provincial departments of education, these exams should be administered by the Council of Ministers of Education. As importantly, the Council of Ministers could issue teaching certificates that would be recognized in all provinces and territories. The average scores and the range of scores for students admitted to each faculty of education, in each province and territory, should be published by the Council of Ministers.

Using high quality admission exams, and not "dumbing" the exams down because of political pressure from interest groups, would mean that teacher education programs would be similar to other university-based professional programs, such as dentistry, law, and medicine, where students write nationally-recognized admission and certification examinations that are independently administered and assessed.

Recommendation 2: *Ensure that teachers are competent in their teaching subjects*

Considerable research shows that teachers' performances on standardized certification exams in the subjects they teach are related to the academic performances of their students (Ballou & Podgursky, 1995; Goldhaber & Anthony, 2003; Stinebrickner, 2001). Therefore, the Council of Ministers of Education should also administer certification exams for student teachers from all faculties of education across the country. Specifically, the Praxis II exams could be used for certifying candidates who aspire to teach at various grade levels and subject areas. Having these certificates recognized in all provinces and territories would allow more mobility for teachers.

Recommendation 3: *Implement recertification exams*

Beginning teachers should be issued provisional certification for about three years, but after that they would need to pass certification exams. After passing the exams, teaching certificates would be issued to those recommended to the Council of Ministers by principals and superintendents. These certificates would be valid for say seven years, after which the teachers would need to recertify by writing another set of certification exams. Those who pass these advanced exams would receive a contract for another seven years, and they would also receive substantial increases in their salaries. This recommendation would help weed out teachers who do not stay current in their subjects and do not keep up with effective teaching methods and strategies. In addition, this recommendation would give school administrators a legitimate way of releasing teachers who do not contribute to student academic achievement.

Recommendation 4: *Establish new salary schedules*

As already shown, current salary schedules do not reflect teachers’ contributions to students’ academic achievement. Thus, new schedules should be created that better reflect effective teaching and do not simply increase teachers’ salaries when they obtain more post-secondary education and/or more teaching experience. There are some basic principles to consider in developing new salary schedules. As noted, teachers who pass the advanced certification examinations should receive substantial increases in their salaries. In addition, schools that demonstrate that their students are progressing at acceptable, or better, rates should receive block grants from their districts that would be awarded by principals in cooperation with superintendents to teachers and other personnel on the basis of their contribution to the students’ academic progress. In this way, teachers and other personnel could receive merit awards which better reflect the work they have done. More thought, of course, needs to be done on the salary schedules to ensure they effectively reward teachers, and other school personnel who are particularly effective and not reward teachers, principals, and other school personnel who are not.

Recommendation 5: *Retaining effective teachers*

Considerable evidence suggests that principals and vice-principals are very good at identifying excellent teachers and other school personnel (Chubb, 2012: 115; Podgursky, 2004: 260), but they must be empowered to hire—and fire—they so that they can create school-based teams who work together to improve their students’ academic achievement. Thus, it is recommended that beginning teachers are hired by principals (along with superintendents) for their provisional certification period of three years. After that, principals should be free to retain or hire new teachers so that they could build “winning teams” that work together effectively to advance the students’ learning in their school.

In provinces and territories where principals are members of teachers’ unions, such as Manitoba, legislation would need to be enacted to remove them from the unions so they can work closely with superintendents in making decisive administrative decisions in hiring, retaining, and promoting the most effective teachers. In areas where principals are obligated to hire teachers on the basis of their ranking on “occasional teachers’ lists” (substitute teachers), such as Ontario, legislation would need to be enacted to allow principals to hire, retain, and promote the most effective teachers and not those who have the longest tenure as substitute teachers in the district.

Conclusion

There is little evidence that monopolistic schools do a good job of educating students, something James Heckman pointed out in 1999. The traditional ways of certifying and paying teachers, particularly on the amount of post-secondary education they have received and their years of teaching experiences, have not changed the incentives that teachers and principals have for ensuring that public school students are achieving academically. As such, some schools and some teachers do substantially better at teaching students than other schools and other teachers. Only by strengthening the certification of teachers through the awarding of provisional and limited-term teaching certificates, ensuring that teachers write and pass rigorous certification examinations, and by making teachers and principals more accountable for the performances of their students can policy makers challenge the supremacy of the entrenched and powerful interest groups—mainly teachers’ unions, faculties of education, and school boards—to ensure that all children are adequately educated (Foster, 2013; Scafidi, 2012).

The policies proposed here begin to provide the incentives and accountability needed for improving students’ academic performances in public schools without unduly threatening the job security of teachers and principals. Specifically, the five recommendations are designed to give school administrators, their teachers, and other personnel adequate time and rewards to improve the performances of their students, particularly in the national languages, English and French, and mathematics. If these recommendations were implemented, those with vested interests in the status quo would become more accountable to parents and citizens for their professional work. Specifically, well-educated and well-spoken teachers, other school personnel, and administrators who have considerable passion and commitment to students’ learning would be attracted, engaged, and retained, while those

without the necessary skills and passions would be encouraged to leave the profession.

Consequently, public school students would be more likely to become better educated, thereby allaying some of the concerns that parents, taxpayers, politicians, and business leaders have about the quality of education in Canadian public schools. There is little doubt that parents realize that the quality of their children's education directly affects their future employment and success, and there is little doubt that politicians and business leaders realize that the quality of student education affects the future economic and political viability of provinces, territories, and the country as a whole. It is now time to act on what we know by selecting, certifying, and rewarding teachers and public schools that effectively advance the education of their students.

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