

Evaluating changes to Beginning Teacher Support Funding

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Authors

Sara Rahman and James Finn

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For more information about this report, please contact:

Centre for Education Statistics and Evaluation

Department of Education

GPO Box 33

SYDNEY NSW 2001

info@cese.nsw.gov.au

+61 2 7814 1527

education.nsw.gov.au/cese

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We acknowledge the homelands of all Aboriginal people and pay our respect to Country.

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Executive summary

What did we evaluate?

From 2014, Beginning Teacher Support Funding (BTSF) was provided to schools with the equivalent of two hours per week release time for each permanent beginning teacher and one hour per week release time for an experienced teacher to provide mentoring support. Schools would receive second year funding equivalent to one hour per week release time for the beginning teacher only. Prior to 2014, there was no consistency in the inductions received by beginning teachers in NSW.

Since 2016, two policy changes have been made to BTSF. First, to expand it to eligible temporary beginning teachers that meet all of the eligibility criteria, one of which is that teachers have not yet achieved Proficient teacher accreditation status. Second, to exclude permanent beginning teachers accredited at the Proficient level from Term 2, 2016 onwards.

We aimed to identify the effect of providing BTSF payments, to fund release time and professional development, on the confidence of eligible temporary beginning teachers, who started receiving BTSF in 2017. We also aimed to identify whether there were any negative impacts of withdrawing BTSF from permanent beginning teachers accredited at the Proficient level from Term 2, 2016 onwards.

How did we evaluate this?

Teacher confidence tends to increase naturally over their first year of appointment. We need to separate this ordinary growth in confidence from that caused by BTSF. To deal with this, we used before and after ratings of temporary beginning teacher confidence, comparing changes in confidence over time between teachers who received BTSF to those who did not. This helps us identify the additional growth in teacher confidence over the first year of teaching owing to BTSF.

Would teachers have had similar increases in confidence without BTSF?

For this analysis to be credible, we had to demonstrate that both groups of teachers, the treatment group (eligible – less experienced teachers who qualified for BTSF) and the comparison group (Ineligible – more experienced teachers who did not qualify for BTSF), are likely to have had similar increases in confidence to each other if BTSF had not been available. We tested this assumption using previous cohorts of teachers. For temporary beginning teachers, we examined confidence ratings of both eligible and ineligible temporary beginning teachers appointed in 2016, all of whom did not receive BTSF, as the policy change had not started. We found that these groups of teachers had similar gains in confidence scores over their first year.

As permanent beginning teachers appointed from Term 2, 2016 onwards who had obtained Proficient accreditation did not receive BTSF, we tested whether teachers appointed in Term 1 in 2014 and 2015 had similar gains in confidence with teachers appointed in Terms 2, 3, and 4 when BTSF had been available. We found that this is the case, testing this using survey data collected for a previous GTIL evaluation.

What did we find?

We found that:

- Temporary beginning teachers who received BTSF experienced an average increase in confidence of approximately 0.43-0.54 points additional to the 0.95 point increase in confidence among teachers who did not receive BTSF.
- There are no significant impacts of withdrawing BTSF from permanent beginning teachers.

Both results hold across a range of model specifications, and when estimated on a sample of teachers matched on a set of variables common to both groups. These included characteristics like their accreditation level, previous teaching experience, whether they were employed on a full or part-time basis and the location of their school. Other school-level characteristics such as student performance in reading and numeracy, and proportion of students with a language background other than English and a measure of socioeconomic status were also included.

What can we conclude?

The department's decision to provide BTSF to less experienced, eligible beginning temporary teachers has had benefits to the confidence of those teachers. Meanwhile, the decision to withdraw it from permanent beginning teachers who had achieved Proficient accreditation has had no adverse effects on such teachers' confidence over their first year of appointment.

What are the limitations of these findings?

This evaluation only examined teacher confidence, measured on a scale that has not been validated. However, we find that it the scale is associated with a greater likelihood of being appointed to a permanent position in a supplementary analysis. A further limitation is that we could not gather data from teachers who left the department in their first year of teaching. If teachers with low confidence are more likely to leave, and there is higher attrition in either the intervention or comparison groups, our results could be biased.

Introduction

Great Teaching, Inspired Learning – A blueprint for action (NSW Government 2013) – hereafter referred to as GTIL – was a major education reform which aimed to improve the quality of teaching in NSW. It set out actions which span the career cycle of a teacher from initial teacher training and induction for beginning teachers through to how to best recognise and value experienced teachers and support school leaders.

Specifically, Action 7.1 of GTIL states:

The responsibilities or teaching loads for permanent beginning teachers should be restructured so they can be supported by mentoring and collaborative practices.

An action under GTIL was to provide increased support for teachers at the beginning of their careers. At the time, when teachers began teaching at their first school, some were well supported with induction processes and others were not. Beginning teachers often had a full teaching load and set of responsibilities from their first day at school and only some teachers received support and feedback from mentor teachers.

Beginning Teacher Support Funding

Action 7.1 was implemented through Beginning Teacher Support Funding (BTSF), provided to schools to support professional development of beginning teachers. From 2014, BTSF was provided to schools with the equivalent of two hours per week release time for each permanent beginning teacher and one hour per week release time for an experienced teacher to provide mentoring support. In the second year of the beginning teacher's appointment, support is reduced to the equivalent of one hour a week for the beginning teacher and no support is provided for the experienced teacher to provide mentoring.

Schools do not have to apply for BTSF; it is automatically distributed to all schools when eligible teachers commence. A memorandum describing the accountability processes for use of the funds was sent to principals on 10 June 2014. It specified that principals account for expenditure through the annual school report. Directors, Educational Leadership must also verify that principals are using the funds against the following four conditions as part of their annual performance appraisal:

- Beginning permanent teachers have reduced responsibilities or teaching loads sufficient to support the development of their skills in the first year.
- Beginning permanent teachers are provided with ongoing feedback and support that is embedded in the collaborative practices of the school.
- Mentoring structures and collaborative practices support beginning permanent teachers within the school or across a cluster of schools, and any teacher mentors have access to specific training and flexibility in their teaching responsibilities to support classroom observation and provide structured feedback.
- Beginning permanent teachers have access to professional learning that focuses on classroom and behaviour management, strategies to build student engagement, collaborative professional practices within the school, and productive relationships with parents and caregivers.

Changes to BTSF eligibility

BTSF was restricted to permanent beginning teachers at Conditional or Provisional accreditation at commencement, starting from Term 2, 2016.

The BTSF policy was then expanded to temporary beginning teachers in 2017. Temporary beginning teachers were eligible for BTSF if:

- They were appointed to a consecutive four-term full-time contract.
- They had no more than two years full-time experience with the Department (excluding casual experience).
- They had not yet achieved Proficient accreditation prior to their entry of duty date.

Evidence and previous evaluations

Generally, programs which involve reduced loads for beginning teachers are classified as 'induction programs'. Much existing evidence relates to induction programs that bundle multiple types of support together. Many of these programs include aspects of training, mentoring and reduced teaching loads, and few evaluations have attempted to separate these aspects. This means there is relatively little evidence about the effectiveness of reduced loads for beginning teachers as a single intervention.

There have been two reviews of the effectiveness of beginning teacher support programs which employ reduced teaching loads, training and mentoring in to varying degrees. An evidence review (Lopez et al. 2004) commissioned by the U.S. Department of Education summarised early empirical evidence around these programs. Only 12 evaluations were found to be relevant, ten of which examined the effects of beginning teacher support on teacher quality. Out of these, four reported positive effects, with the rest resulting in mixed or null findings. A more recent review of induction programs was conducted by Ingersoll and Strong (2011). Despite the passage of seven years, this report was only able to identify two additional studies meeting their standards for rigour. In general, they found support for these programs improving teacher and student outcomes. However, they noted vast differences in design between the content, duration, and delivery of these programs. Their conclusion was that these differences make it difficult to generalise these effects to other programs. While these are positive, most other Australian literature on the topic has been descriptive or qualitative in nature (Maxwell et al. 2010, Paris 2013, Kidd et al. 2015) and thus, unable to shed further light on whether these programs have been effective in NSW settings.

In February 2017, CESE released an evaluation of beginning teacher support initially introduced as part of GTIL (Centre for Education Statistics and Evaluation 2017). This included analysis of the effects of BTSF on permanent teacher confidence and practice. The evaluation compared teachers appointed to permanent roles in 2013 and 2014/15. Only the latter group received BTSF. Multi-level ordered and binary logistic regression analyses were used. These estimate the association between BTSF and teacher confidence and practice, accounting for available observed characteristics. The evaluation found that BTSF support increased teachers' ratings of their confidence at the end of their first year of teaching.

Note that this evaluation compared successive cohorts of teachers – that is, permanent beginning teachers appointed in 2014 and 2015 versus those in 2013. There was no available comparison group of similar teachers starting at the same time as BTSF was provided to all permanent beginning teachers. Thus, there are several potential limitations of this approach. For one, the introduction of BTSF may have coincided with other changes that occur across years. For example, there may be different hiring and on-boarding practices across years in schools, which could affect growth in confidence over the first year. The introduction of other policy between those years could change how schools operate and affect how beginning teachers gain confidence. Finally, teachers who start in different years may have been exposed to different forms of training, university assessment, entry standards, and pre-service teacher programs.

Evaluation aims

This evaluation aims to add to the existing evidence base for the effectiveness of BTSF. The evaluation will address two questions:

1. What was the impact on teacher confidence of the expansion of BTSF to temporary beginning teachers in 2017?
2. What was the impact on teacher confidence of the restriction of BTSF to less experienced permanent teachers starting from Term 2, 2016 onwards?

Method

The changes in BTSF policy offer the opportunity to evaluate the impacts of BTSF in a more rigorous way compared to the previous evaluation. The previous evaluation was limited by the nature of the rollout of BTSF to all permanent beginning teachers in 2014. This meant the only available comparison was to permanent beginning teachers who started in 2013. This comparison was vulnerable to other changes occurring in schools in 2014 and 2015 which could affect teacher confidence, and GTIL contained a range of such actions.

The policy changes to BTSF that we are evaluating affected a subset of permanent and temporary beginning teachers. This means that we can use the unaffected teachers in the same year as comparison groups, rather than comparing BTSF recipients to previous cohorts.

Data

The analyses used data from surveys of permanent and temporary beginning teachers. CESE developed these surveys for previous BTSF process and outcome evaluation. The survey questions covered a range of topics related to the reforms including:

- teachers' NESA accreditation status and years of teaching experience
- teachers' familiarity and experiences with actions under GTIL, including:
 - whether teachers were aware of and received BTSF
 - the number of BTSF hours eligible teachers received
 - teachers' perceptions of how any support they received impacted aspects of their teaching practice
- teacher confidence at various points in their appointment.

The survey data were linked to the Schools Master Reference dataset (Centre for Education Statistics and Evaluation 2019a). This data includes data on time-invariant school-level characteristics. We also used CESE data on enrolments among specific groups, and average school performance data. The specific data items from these datasets are presented in the next section.

Table 1 presents the survey collection details for the temporary beginning teachers and the permanent beginning teacher. These surveys sampled all beginning teachers in those years. Of these, between one quarter and one third of beginning teachers responded, with the exception of the permanent beginning teachers in 2014, where approximately 40% responded.

Table 1:
Sample details

Temporary beginning teachers			
Year of commencement	Sampled	Responded	Response rate (%)
2016	3550	933	26.3
2017	5550	1436	25.9
Permanent beginning teachers			
Year of commencement	Sampled	Responded	Response rate (%)
2014	2069	843	40.7
2015	2094	600	28.6
2016	2141	667	31.2

Variables

Table 2 illustrates the variables used in the analyses and their definitions.

Table 2:
Variable list

Variable	Definition
Outcome variable	Teacher confidence, measured on a 1-10 scale at the beginning of their appointment and at the end of their first year of teaching.
Intervention variables	Eligibility for BTSF under policy changes: • Temporary beginning teachers were eligible for BTSF if they commenced from Term 1, 2017, were employed on a consecutive four-term full-time contract, had no more than two years full-time experience with the department and had not yet achieved accreditation at Proficient Teacher level at the time of commencement. • Permanent beginning teachers were eligible for BTSF if they had not yet achieved accreditation at Proficient level.
Teacher characteristics	• Teachers' previous teaching experience in years, truncated at 10 years.¹ • Teachers' accreditation levels (Conditional, Provisional or Proficient).²
School characteristics	• School size: measured by headcount enrolments from the National School Statistics Collection (NSSC; collected the first Friday of August each year), included as a continuous variable (Centre for Education Statistics and Evaluation 2019b). • ASGS Remoteness: coded into major cities, inner regional, and outer regional, remote or very remote (Australian Bureau of Statistics 2016). • Index of Community Socio Educational Advantage (ICSEA): a numeric scale that represents the level of educational advantage in a school based on both student and school-level factors (Australian Curriculum, Assessment and Reporting Authority (ACARA) 2018). • Student body composition: separate variables recording the proportion of students who were: ◦ Aboriginal or Torres Strait Islander ◦ female ◦ with a language background other than English. • School achievement variables: average scaled NAPLAN Reading and Numeracy scores for that year.

¹ Approximately 8% of the teachers in the sample were removed. Reasons for the relatively large proportion of 'beginning teachers' having such extensive experience (in elapsed time) include teachers having only casual teaching experience (30% of these teachers as measured by another survey question). While we have no specific data on this, it may also be caused by having previous experience in other teaching sectors, or having time out of the teaching workforce between appointments.

² Teacher accreditation is conferred by NESA. It is a system which assesses a teacher's achievement of the Australian Professional Standards for Teachers (Australian Institute for Teaching and School Leadership (AITSL) 2010) (NSW Education Standards Authority 2014) (NSW Education Standards Authority 2014) (NSW Education Standards Authority 2014). The system is based on nationally agreed indicators of teacher quality, against the different possible levels of accreditation.

Note that our main outcome measure, confidence is measured on a simple scale that has not been validated. We conducted several analyses to examine whether it is predictive of other indicators of teacher progress or growth: achievement of Proficient accreditation status, time to Proficient accreditation status, and the likelihood of being appointed to a permanent position. We find that a one-point increase in the confidence scale is associated with a five percentage point increase in the likelihood of a temporary beginning teacher being appointed to a permanent position in the department (Table A1).

Analysis

We could estimate the effect of BTSF on teacher confidence by examining the increase in confidence over time for teachers who received it. However, this comparison would capture the effect of BTSF as well as those of ordinary release hours. This 'effect' would also include ordinary growth in teacher confidence over the first year of teaching.

We could also compare the confidence ratings of teachers who received BTSF and those who did not at the end of their first year. Such an approach would require that we account for all other differences between the groups. If the comparison is between teachers who started in 2017 and previous years, we would need to account for all other changes happening in schools between those years. The small set of control variables in our analyses are unlikely to capture all such changes.

We therefore undertake a difference-in-differences (DiD) estimation of the effect of BTSF on teacher confidence. This technique contrasts changes in confidence over the first year of teaching for teachers receiving BTSF to a group of teachers who do not.

The method is valid under two conditions:

1. Ineligible teachers are unaffected by the BTSF provided to eligible teachers.
2. The two groups of beginning teachers being compared would have experienced the same growth in confidence if BTSF had not been introduced (that is, there would have been no difference in the growth in confidence between the two groups if BTSF did not exist).

The first condition cannot be tested. It may be satisfied in most cases as BTSF funding was administered centrally based on appointments, and many schools cited using it as relief time. However, some schools may have used the funding to engage in professional development for all their teachers, including ineligible teachers. We run a robustness check to deal with this, which is explained below. We provide evidence to support the second assumption; this forms the first part of our research procedure.

Common trends tests

For temporary beginning teachers we test whether growth in confidence between eligible and ineligible teachers is likely to have been the same if BTSF had not been introduced. To do this, we compare eligible and ineligible temporary beginning teachers' growth in confidence in 2016, the year prior to the expansion of BTSF to temporary teachers.

Our analysis for permanent beginning teachers aims to test the impact of **withdrawing** BTSF. Thus, we test whether eligible and ineligible permanent teachers' confidence increased at the same rate over time when both groups did receive BTSF in 2014 and 2015.

The results of these analyses are presented along with our main results. In both cases, we find strong evidence that prior cohorts of these groups demonstrate similar rates of growth in confidence in the years prior to the policy changes. This means that it is appropriate to compare teachers eligible to receive BTSF with those who are ineligible. This will provide evidence of the impact of BTSF on teachers' confidence.

Difference-in-differences analysis

In general, our difference-in-differences approach estimates several forms of the following equation:

$$Y_{it} = \beta_0 + \beta_1(t * X_i) + \beta_2t + \beta_3X_i + \beta\gamma' + \varepsilon$$

The outcome for a teacher at period Y_{it} is regressed on:

- the time indicator Y_{it} (0 at time of appointment, 1 in any follow-up period) to account for changes in confidence which occur over the first year for all teachers
- the treatment indicator X_i (0 for comparison group, and 1 for the BTSF group) to account for any differences in confidence arising from pre-existing differences between the groups
- the interaction of time and treatment ($t * X_i$) which captures average changes in confidence at the end of the first year of teaching only experienced by those who receive BTSF (that is, the difference-in-differences estimator)
- γ is the vector of teacher- and school-level characteristics, and school and operational directorate fixed effects, which we include in some specifications. These adjust for observed differences between teachers and schools in each group, and unobserved differences in schools they are appointed in, and the operational directorates these schools belong to.

The coefficient β_1 is the coefficient of interest (the treatment effect).

For permanent beginning teachers, we run a 'reverse' difference-in-differences. This compares experienced teachers appointed from Term 2 onwards in 2016 (who became ineligible for BTSF) with their counterparts appointed in Term 1 (who received BTSF). This enables us to estimate the impacts of withdrawal of BTSF on this group.

While our analysis mainly relies on the common trends assumption (the groups having similar trends in their outcomes without BTSF), a good robustness check is to run the analysis on a matched sample – which included their accreditation level, previous years teaching experience, whether they were employed on a full or part-time basis and the location of their school. Other school-level characteristics such as student performance in reading and numeracy, and the proportion of students with a language background other than English and a measure of socioeconomic status were also included. This ensures that there is no possibility that differences in other characteristics at the time of appointment cause bias in teachers' growth in confidence.

We also run a further check. The process evaluation of BTSF indicated that in some schools, the funding was not used to provide relief to individual teachers. Instead, the funding was used to provide support to all beginning teachers via structured programs. To guard against this biasing our results, we run an analysis for the temporary beginning teacher sample where we exclude schools who had both eligible and ineligible teachers. This tests whether the effects hold when we compare schools who received BTSF vs. those who did not.³

³ We are unable to do this for permanent beginning teachers due to a low sample size. Applying this check leaves only 15 teachers in the intervention group.

Results

Temporary beginning teachers

Table 3 shows the characteristics of our temporary beginning teacher sample, by eligibility and starting year. In general, eligible teachers starting in 2016 and 2017 were similar on most of their characteristics. However, ineligible teachers slightly differed across years on prior teaching experience and accreditation levels. Overall however, there was remarkable similarity between the groups, which strengthens our use of the previous cohort in testing the common trends assumption.

Table 3:
Sample characteristics of temporary beginning teachers by eligibility and starting year

Eligible temporary beginning teachers	Starting year				
	2016 (n=87)		2017 (n=200)		
Continuous variables	Mean	SD	Mean	SD	p-value
Previous teaching experience	1.07	1.49	1.43	2.06	.142
Enrolment – total (NSSC FTE)	646.07	349.03	605.68	328.45	.349
Proportion of ATSI students	0.08	0.13	0.09	0.13	.380
Proportion of LBOTE students	0.35	0.29	0.36	0.32	.844
Proportion of female students	0.49	0.10	0.49	0.09	.895
Index of Community Socio-economic Advantage (ICSEA)	1012.27	98.13	1002.36	98.27	.445
Average NAPLAN Reading scaled score	493.44	63.15	488.38	60.62	.310
Average NAPLAN Numeracy scaled score	493.01	71.57	484.97	68.83	.155
Categorical variables	N	%	N	%	p-value
NESA accreditation					.057
Conditional	27	31.0%	86	43.0%	
Provisional	60	69.0%	114	57.0%	
ASGS Remoteness area of school					.954
Major cities	61	70.1%	143	71.9%	
Inner regional	17	19.5%	37	18.6%	
Outer regional, remote or very remote	9	10.3%	19	9.5%	
Employment status					.165
Full-time	86	98.9%	197	98.5%	
Part-time	0	0.0%	3	1.5%	

Ineligible temporary beginning teachers	Starting year				
	2016 (n=590)		2017 (n=832)		
Continuous variables	Mean	SD	Mean	SD	p-value
Previous teaching experience	1.52	2.53	2.24	3.19	<.001
Enrolment – total (NSSC FTE)	587.76	345.92	604.01	347.51	.385
Proportion of ATSI students	0.09	0.13	0.10	0.14	.455
Proportion of LBOTE students	0.35	0.32	0.34	0.32	.916
Proportion of female students	0.48	0.12	0.48	0.12	.395
Index of Community Socio-economic Advantage (ICSEA)	988.81	97.41	985.11	93.20	.477
Average NAPLAN Reading scaled score	487.29	66.42	493.44	63.15	.081
Average NAPLAN Numeracy scaled score	485.78	75.17	493.01	71.57	.070
Categorical variables	N	%	N	%	p-value
NESA Accreditation					<.001
Conditional	209	35.4%	285	34.3%	
Provisional	336	56.9%	422	50.7%	
Proficient	45	7.6%	125	15.0%	
ASGS Remoteness area of school					.179
Major cities	435	73.7%	577	69.4%	
Inner regional	105	17.8%	167	20.1%	
Outer regional, remote or very remote	50	8.5%	88	10.6%	
Employment status					<.001
Full-time	433	73.4%	601	72.2%	
Part-time	147	24.9%	231	27.8%	

The simplest difference-in-differences model contrasts average outcomes for each group before and after the intervention. This is demonstrated in Figure 1 below. While ineligible temporary beginning teachers (those who are more experienced) had higher average ratings at the start of their first year of appointment, ineligible teachers who received BTSF experienced significantly higher growth over their first year. Note that these rates of growth were similar between the same groups appointed in the previous year (a placebo test, as neither received BTSF). Thus, BTSF increases confidence by 0.54 points for eligible temporary beginning teachers.

Figure 1:

The impact of receiving BTSF on temporary beginning teacher confidence, simple difference-in-differences model

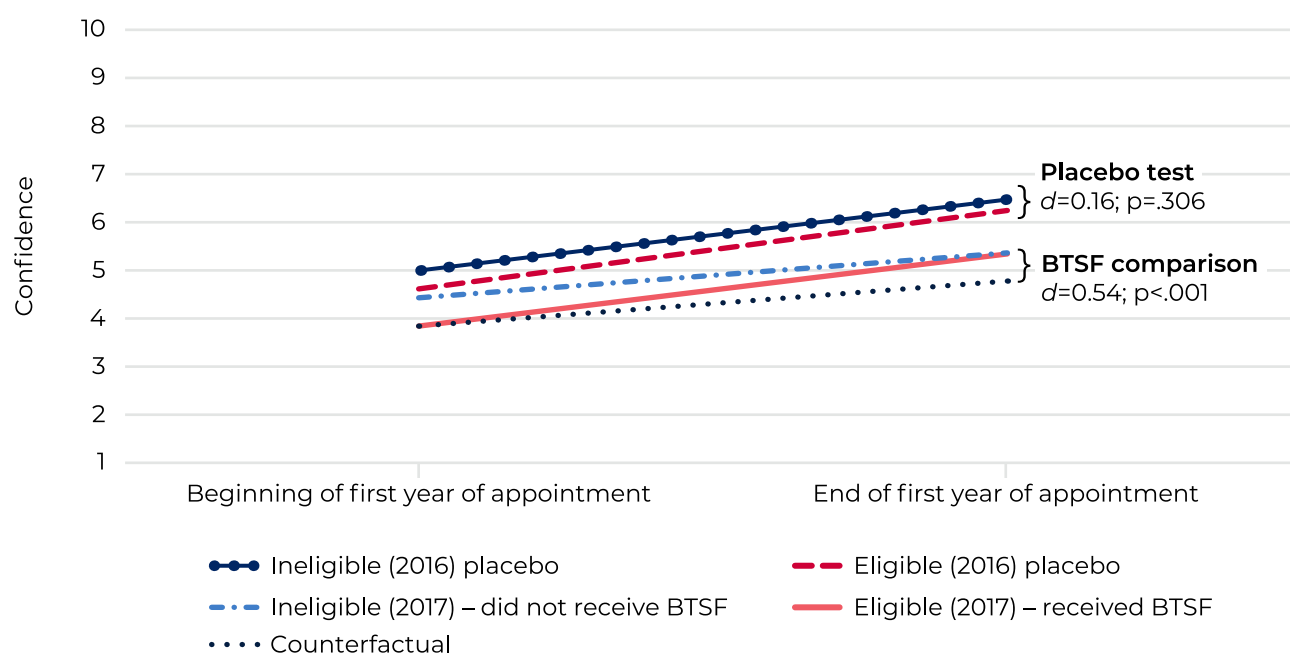
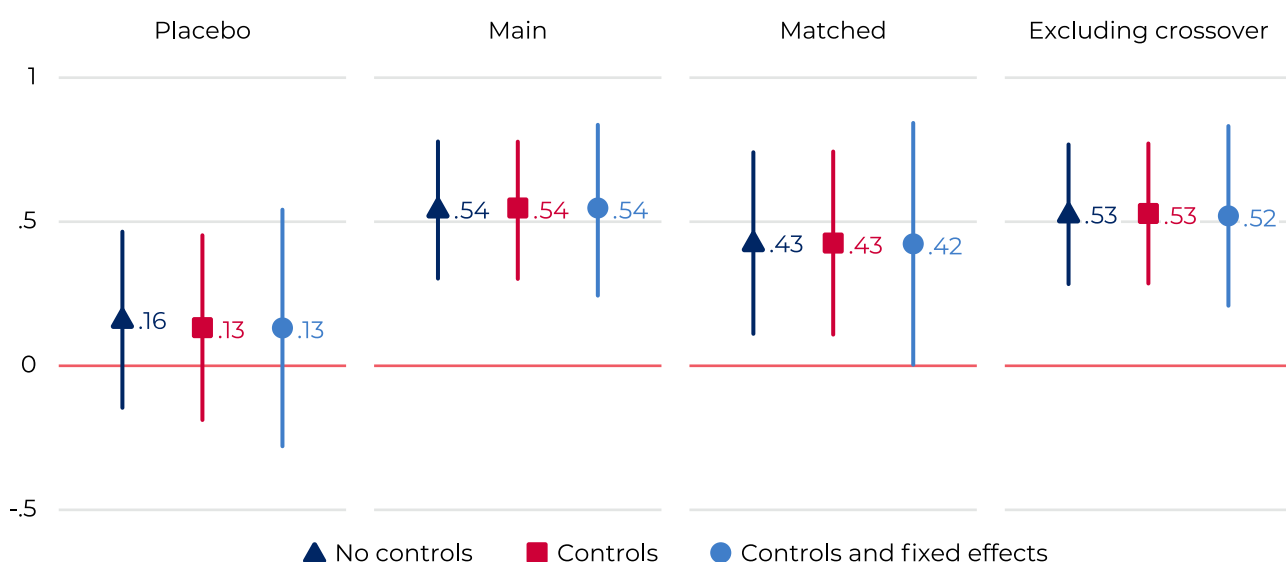


Figure 2 shows the results of our placebo test, which estimated the difference-in-differences model on teachers from the 2016 cohort. As both groups did not receive BTSF, this estimate should be very close to zero. We find little difference between the groups' rates of growth of confidence. This provides support that the common trends assumption is likely to hold.

Figure 2 also shows our estimates of the impact of BTSF on teachers in 2017 under different specifications. Our main analysis specification compares all eligible temporary beginning teachers to all ineligible temporary beginning teachers. We also estimate the effect on a matched sample (where similar teachers teaching in similar schools are compared). Finally, we exclude potential crossover by only comparing schools where at least one teacher received BTSF to schools where no beginning teachers received BTSF. The consistency of these estimates under different conditions, with the estimated impact of BTSF ranging from a 0.42 to 0.54 point increase in confidence, suggests that our results are robust. The regression tables are presented in Appendix 2 (Table A4).

Figure 2:

All difference-in-differences estimates, temporary beginning teachers



Permanent beginning teachers

Table A2 (in Appendix 2) presents the characteristics of our permanent beginning teacher sample, divided by years of appointment (that is, 2014 and 2015, before the changes to BTSF; 2016, after the changes to BTSF). It also divides the sample by term of appointment. Recall that our main comparison analyses the impacts of removal of BTSF from permanent beginning teachers with Proficient accreditation commencing in Terms 2-4 of 2016, by comparing them to their counterparts commencing in Term 1 of the same year. We test the validity of this analysis by comparing the same groups, appointed in 2014 and 2015. Teachers appointed in Term 1 and subsequent terms demonstrate similar characteristics in 2014 and 2015, with the exception of ICSEA. However, those appointed in Term 1 of 2016 demonstrate greater average prior teaching experience than their counterparts appointed later. This suggests that we may prefer our difference-in-differences analyses which control for observed characteristics, or those estimated on a matched sample, to the main model.

We present the results of a simple difference-in-differences analysis in Figure 2 below. This suggests that the impact of withdrawal of BTSF from permanent beginning teachers with Proficient accreditation was nearly zero (0.07 points on our confidence scale).

Figure 3:

Estimated impact of withdrawal of BTSF from Proficient permanent beginning teachers, simple difference-in-differences

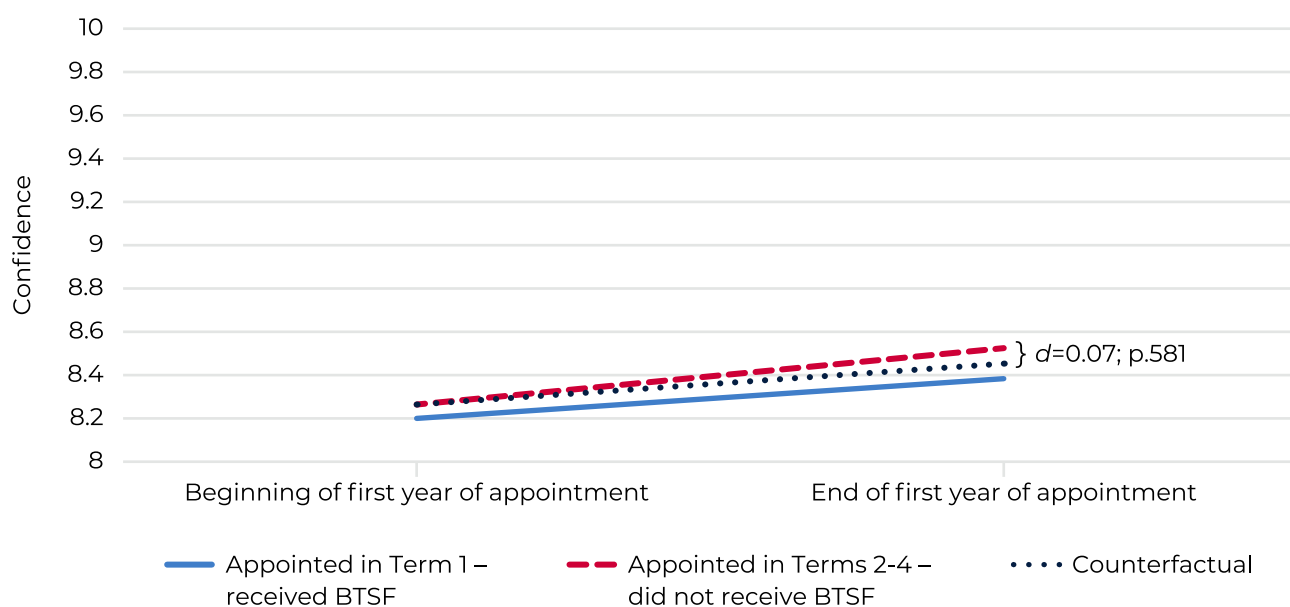
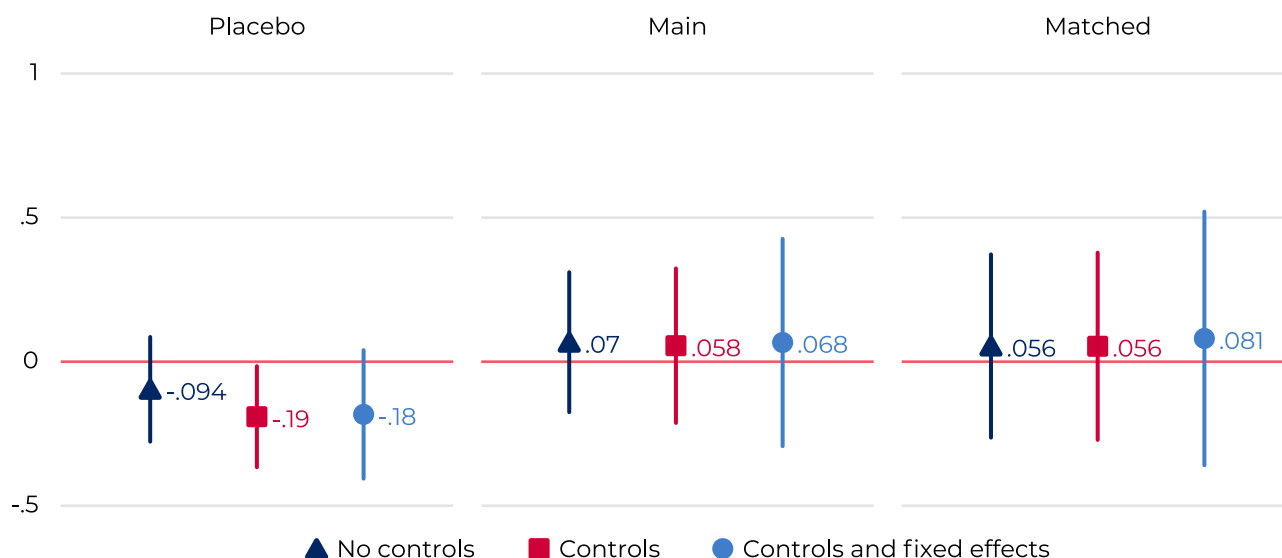


Figure 4:
All difference-in-differences estimates, permanent beginning teachers



As with temporary beginning teachers, we run several specifications of our analyses. This helps us determine how robust this estimate is when different variables are included, and when run on a matched sample. The full range of our estimates are presented in Figure 4, with tables in Appendix 2 (Table A5).

These results show that first, our placebo test tends to hold; the differences in confidence for the same groups of permanent beginning teachers in prior years tend to be small, and non-significant. Thus our common trends assumption appears to hold, although, these differences grow larger as we control for teacher characteristics and school and operational directorate effects.

Nonetheless, our estimates of the impact of BTSF withdrawal are remarkably consistent across different specifications. In summary, we find little evidence to suggest that withdrawing BTSF from permanent beginning teachers who had achieved Proficient accreditation had a negative impact on teacher confidence.

Discussion

We attempted to evaluate the impacts of two changes to Beginning Teacher Support Funding (BTSF) policy. The first was the expansion of the program to less experienced, eligible temporary beginning teachers in 2017. The second was the exclusion of permanent beginning teachers accredited at the Proficient level from Term 2, 2016 onwards.

A consideration in evaluating the impact of BTSF on confidence over time is that beginning teachers generally gain confidence over their first year in an appointment. Thus, identifying growth in confidence attributable to BTSF, occurring above normal increases in confidence was critical. We estimated the changes in policy which happened to particular groups of permanent and temporary beginning teachers using a difference-in-differences analysis. This isolates increases in confidence only for affected teachers after receiving BTSF.

We found that less experienced, eligible temporary beginning teachers' confidence increased by approximately 0.42-0.52 points, on average, over their first year because of BTSF. This is in addition to the 0.95 point average increase in confidence over the first year experienced by teachers who do not receive BTSF. We also found that the policy change to withdraw BTSF for permanent beginning teachers with Proficient accreditation did not significantly reduce their growth in confidence. These results were robust across a range of specifications and sensitivity checks.

Nonetheless, we should note the limitations of these findings. First, our measure of confidence was a simple 1-10 scale that was not validated. Furthermore, it was self-reported. Second, our results may be susceptible to non-response bias and missing data. Also note that only teachers retained in the system could respond to surveys. If some teachers who do not receive BTSF have lower levels of confidence, and are more likely to leave the department because of it, they are not included in this evaluation. Thus the findings may be biased. However, we do not have appropriate data on teacher retention to be able to test this empirically. Finally, we do not know whether these impacts on confidence flow on to other desirable policy goals such as retention and student outcomes.

There are a range of policy outcomes the department may consider desirable for interventions targeting teachers. These might include retention, quality of teaching, wellbeing and satisfaction, and impact on student outcomes. Furthermore, linking teacher quality to student outcomes is currently difficult to do using existing data. The department should consider improved measurements of these, so that program impacts against these ultimate outcomes can be demonstrated.

Ultimately this evaluation suggests that the department made effective changes to the policy which were also supported by previous evaluations. First, we find a significant positive impact of the expansion of BTSF to less experienced temporary beginning teachers on teachers' self-ratings of their confidence. Second, we find that the cost-savings generated from restricting BTSF to permanent beginning teachers who had yet to achieve Proficient are substantial, without having a significant impact on confidence. However, our analysis here does not demonstrate that BTSF was effective for permanent beginning teachers. It only shows that its withdrawal from permanent beginning teachers who had achieved Proficient status did not negatively impact their confidence. We cannot say that BTSF is effective for the group of teachers who continue to receive it, although previous work suggests that there is a correlation between BTSF funding and confidence for this group. Further research which seeks to identify the effectiveness of BTSF funding to permanent beginning teachers could be done if a suitable comparison group arises. Generally speaking, we want to compare groups over the same time period. This makes it more plausible that the differences between the groups can be attributed to the intervention rather than other changes between time periods.

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Appendix 1: Association between confidence, proficiency and employment outcomes

This report examined a single, self-reported measure of confidence as the main outcome measure. The practical significance of an increase in this measure of confidence is unknown. Thus, we investigate the relationship between temporary beginning teachers' confidence at the end of the first year of appointment and:

1. whether they attained Proficient accreditation (proficiency)
2. the number of days between a teacher's Conditional or Provisional accreditation and becoming proficient, for those who achieved proficiency (time to proficiency)
3. whether the teacher has been appointed to a permanent role (permanency).

It should be noted that none of these outcomes are repeated measurements. Each is an outcome that is yet to be achieved in the future for a temporary beginning teacher at their time of appointment. Hence, we cannot use the same framework used in the main report. Therefore, in this analysis, we focus mainly on temporary beginning teachers in 2016, who were not subject to any treatment, and use simple regression analyses.

We examine associations between confidence and proficiency and permanency among the sample of temporary beginning teachers in 2016 (that is, prior to the expansion of BTSF). Using those who did not receive BTSF ensures that the analysis examines the correlation between confidence and proficiency and employment outcomes outside of any effects of BTSF.

To do this, we undertake a series of regressions:

- a Cox regression of the time taken to reach Proficiency from time of Conditional/ Proficient accreditation on confidence at the end of the year
- logistic regressions of proficiency and being appointed to a permanent position on confidence at the end of the first year.

We present the results of these regressions in Table A1 below:

Table A1:
Results of regressions of teacher outcomes against confidence at the end of their first year

Outcome variable	(1) Time to proficiency	(2) Time to proficiency	(3) Proficient	(4) Proficient	(5) Permanency	(6) Permanency
Confidence at time	0.952 (0.050)	0.949 (0.052)	1.020 (0.088)	1.010 (0.088)	1.277** (0.120)	1.271* (0.128)
Observations	387	378	389	380	416	398
Model Coefficient	Cox Hazard ratio	Cox Hazard ratio	Logistic Odds ratio	Logistic Odds ratio	Logistic Odds ratio	Logistic Odds ratio
Covariates Proficient	No 256	Yes 250	No	Yes	No	Yes

Robust standard errors in parentheses

*** p<.001, ** p<.01, * p<.05

We find that:

- There is no relationship between confidence and time to proficiency. The hazard ratios, which are slightly below one, indicate that those with greater confidence took slightly longer to become proficient, however this is not statistically significant.
- The probability of attaining proficiency was slightly higher for those who were more confident at the end of their first year but this was not statistically significant.
- Finally, the regressions in columns (5) and (6) indicate that confidence is related to greater likelihood of attaining permanency.
 - The odds ratio of 1.2 indicates that the odds of becoming permanent increase by 20% for each additional point in the confidence scale.
 - Converting this to average predicted probabilities, an additional point in confidence is associated with a five percentage point increase in the likelihood of being appointed to a permanent position.
 - This indicates that BTSF may indirectly contribute to temporary beginning teachers' likelihood of obtaining a permanent position. Although this cannot be estimated from these data.

Appendix 2: Tables

Table A2:
Sample characteristics, temporary beginning teachers

Eligible temporary beginning teachers	Starting year				
	2016 (n=87)		2017 (n=200)		
Continuous variables	Mean	SD	Mean	SD	p-value
Previous teaching experience	1.07	1.49	1.43	2.06	.142
Enrolment - total (NSSC FTE)	646.07	349.03	605.68	328.45	.349
Proportion of ATSI students	0.08	0.13	0.09	0.13	.380
Proportion of LBOTE students	0.35	0.29	0.36	0.32	.844
Proportion of female students	0.49	0.10	0.49	0.09	.895
Index of Community Socio-economic Advantage (ICSEA)	1012.27	98.13	1002.36	98.27	.445
Average NAPLAN Reading scaled score	493.44	63.15	488.38	60.62	0.31
Average NAPLAN Numeracy scaled score	493.01	71.57	484.97	68.83	0.16
Categorical variables	N	%	N	%	p-value
NESA Accreditation					.057
Conditional	27	31.0%	86	43.0%	
Provisional	60	69.0%	114	57.0%	
ASGS Remoteness area of school					.954
Major cities	61	70.1%	143	71.9%	
Inner regional	17	19.5%	37	18.6%	
Outer regional, remote or very remote	9	10.3%	19	9.5%	
Employment status					.165
Full-time	86	98.9%	197	98.5%	
Part-time	0	0.0%	3	1.5%	

Ineligible temporary beginning teachers	Starting year				
	2016 (n=590)		2017 (n=832)		
Continuous variables	Mean	SD	Mean	SD	p-value
Previous teaching experience	1.52	2.53	2.24	3.19	<.001
Enrolment - total (NSSC FTE)	587.76	345.92	604.01	347.51	.385
Proportion of ATSI students	0.09	0.13	0.10	0.14	.455
Proportion of LBOTE students	0.35	0.32	0.34	0.32	.916
Proportion of female students	0.48	0.12	0.48	0.12	.395
Index of Community Socio-economic Advantage (ICSEA)	988.81	97.41	985.11	93.20	.477
Average NAPLAN Reading scaled score	487.29	66.42	493.44	63.15	0.08
Average NAPLAN Numeracy scaled score	485.78	75.17	493.01	71.57	0.07
Categorical variables	N	%	N	%	p-value
NESA Accreditation					<.001
Conditional	209	35.4%	285	34.3%	
Provisional	336	56.9%	422	50.7%	
Proficient	45	7.6%	125	15.0%	
ASGS Remoteness area of school					.179
Major cities	435	73.7%	577	69.4%	
Inner regional	105	17.8%	167	20.1%	
Outer regional, remote or very remote	50	8.5%	88	10.6%	
Employment status					
Full-time	433	73.4%	601	72.2%	
Part-time	147	24.9%	231	27.8%	

Table A3:**Descriptive statistics, permanent beginning teachers**

Permanent beginning teachers appointed in 2014 and 2015 with Proficient accreditation	Term of appointment				
	Term 1 (n=461)		Terms 2-4 (n=331)		
Continuous variables	Mean	SD	Mean	SD	p-value
Previous teaching experience	4.85	3.01	4.88	2.86	.900
Enrolment – total (NSSC FTE)	623.66	342.34	623.38	340.08	.990
Proportion of ATSI students	0.08	0.12	0.09	0.14	.210
Proportion of LBOTE students	0.32	0.31	0.37	0.33	.044
Proportion of female students	0.48	0.13	0.47	0.15	.290
Index of Community Socio-economic Advantage (ICSEA)	1005.95	92.44	989.27	96.82	.017
Average NAPLAN Reading scaled score	500.25	62.11	496.04	67.14	.370
Average NAPLAN Numeracy scaled score	496.13	72.67	496.66	79.04	.920
Categorical variables	N	%	N	%	p-value
ASGS Remoteness area of school					.620
Major cities	331	71.8%	246	74.3%	
Inner regional	82	17.8%	57	17.2%	
Outer regional, remote or very remote	48	10.4%	28	8.5%	
Employment status					.710
Full-time	428	92.8%	305	92.1%	
Part-time	33	7.2%	26	7.9%	

Permanent beginning teachers appointed in 2016 with proficient accreditation	Term of appointment				
	Term 1 (n=461)		Terms 2-4 (n=331)		
Continuous variables	Mean	SD	Mean	SD	p-value
Previous teaching experience	5.57	2.71	4.55	2.63	.004
Enrolment – total (NSSC FTE)	591.36	321.50	688.24	407.38	.031
Proportion of ATSI students	0.08	0.12	0.08	0.13	.942
Proportion of LBOTE students	0.36	0.34	0.37	0.31	.721
Proportion of female students	0.49	0.11	0.50	0.15	.750
Index of Community Socio-economic Advantage (ICSEA)	995.79	92.91	993.63	85.03	.855
Average NAPLAN Reading scaled score	486.27	70.20	501.42	61.96	.085
Average NAPLAN Numeracy scaled score	485.76	80.20	502.20	73.55	.105
Categorical variables	N	%	N	%	p-value
ASGS Remoteness area of school					.424
Major cities	139	74.7%	76	81.7%	
Inner regional	28	15.1%	10	10.8%	
Outer regional, remote or very remote	19	10.2%	7	7.5%	
Employment status					.530
Full-time	170	91.4%	87	93.5%	
Part-time	16	8.6%	6	6.5%	

Table A4:
Regression tables, temporary beginning teachers

Test	No controls	Controls	Controls and fixed effects
Placebo test			
Difference-in-differences	0.160 (0.156)	0.132 (0.163)	0.131 (0.209)
R-squared	0.191	0.291	0.652
Covariates	No	Yes	Yes
Fixed effects	No	No	Yes
N	677	648	643
Main comparison			
Difference-in-differences	0.541*** (0.121)	0.540*** (0.121)	0.540*** (0.151)
R-squared	0.097	0.221	0.638
Covariates	Yes	Yes	Yes
Fixed effects	No	No	No
N	1031	999	992
Matched comparison			
Difference-in-differences	0.426** (0.160)	0.426** (0.162)	0.423* (0.213)
R-squared	0.158	0.221	0.748
Covariates	Yes	Yes	Yes
Fixed effects	No	No	No
N	342	342	341
Excluding crossover			
Difference-in-differences	0.526*** (0.124)	0.529*** (0.124)	0.520** (0.159)
R-squared	0.100	0.217	0.665
Covariates	Yes	Yes	Yes
Fixed effects	No	No	No
N	919	888	885

Robust standard errors in parentheses

*** p<.001, ** p<.01, * p<.05

Table A5:
Regression tables, permanent beginning teachers

Test	No controls	Controls	Controls and fixed effects
Placebo test			
Difference-in-differences	-0.0935 (0.0948)	-0.189* (0.0925)	-0.181 (0.117)
R-squared	0.035	0.164	0.636
Covariates	No	Yes	Yes
School fixed effects	No	No	Yes
N	792	722	717
Main comparison			
Difference-in-differences	0.0699 (0.127)	0.0575 (0.139)	0.0683 (0.186)
R-squared	0.008	0.073	0.747
Covariates	No	Yes	Yes
School fixed effects	No	No	Yes
N	279	252	251
Matched comparison			
Difference-in-differences	0.0556 (0.164)	0.0556 (0.167)	0.0810 (0.225)
R-squared	0.024	0.081	0.825
Covariates	No	Yes	Yes
School fixed effects	No	No	Yes
N	144	144	143

Robust standard errors in parentheses

*** p<.001, ** p<.01, * p<.05

Table A6:**Probit regression of propensity score for matched sample of temporary beginning teachers**

Probability of being eligible for BTSF in 2017	Coefficient	Standard error	p-value
Provisional accreditation (relative to Conditional accreditation)	-.034	0.082	.680
Remoteness (relative to major cities)			
Inner regional	.150	0.126	.234
Outer regional, remote or very remote	.296	0.162	.068
Previous teaching experience, years	.035	0.020	.083
Part-time employment status (relative to full-time)	-1.366	0.167	<.001
Proportion of LBOTE students	-.114	0.171	.504
Index of Community Socio-economic Advantage (ICSEA)	.003	0.001	<.001
Average NAPLAN Reading scaled score	.001	0.003	.745
Average NAPLAN Numeracy scaled score	-.003	0.004	.446
Constant	-1.391	0.522	.008

Table A7:**Means and standardised bias, before and after matching, temporary beginning teachers sample**

Variable	Unmatched			Matched		
	Mean – ineligible	Mean – eligible	Bias	Mean – ineligible	Mean – eligible	Bias
NESA accreditation						
Conditional	0.40	0.35	9.9	0.41	0.43	-4.5
Provisional	0.60	0.53	14.5	0.59	0.57	4.4
Previous teaching experience	1.29	1.94	-26.4	1.27	1.27	-0.1
Part-time employment status (relative to full-time)	1.02	1.28	-75.7	1.02	1.02	0.0
Remoteness						
Major cities	0.71	0.71	0.4	0.71	0.68	8.0
Inner regional	0.19	0.19	-0.6	0.19	0.20	-3.7
Outer regional, remote or very remote	0.10	0.10	0.3	0.10	0.12	-7.3
Enrolment – total (NSSC FTE)	617.97	597.27	6.1	623.69	588.99	10.2
Proportion of ATSI students	0.09	0.10	-6.7	0.09	0.09	0.9
Proportion of LBOTE students	0.35	0.34	3.6	0.36	0.34	5.3
Proportion of female students	0.49	0.48	9	0.49	0.48	9.0
Index of Community Socio-economic Advantage (ICSEA)	1005.20	986.64	19.3	1004.10	999.54	4.7
Average NAPLAN Reading scaled score	489.53	490.89	-2.2	489.35	487.60	2.8
Average NAPLAN Numeracy scaled score	486.94	490.01	-4.4	486.82	484.85	2.8

Table A8:**Probit regression of propensity score for matched sample of permanent beginning teachers**

Probability of being Proficient and appointed in Terms 2-4	Coefficient	Standard error	p-value
Previous teaching experience	-0.0730	0.0320	.022
Remoteness (relative to major cities)			
Inner regional	-0.2064	0.2806	.462
Outer regional, remote or very remote	-0.1010	0.3530	.775
Enrolment – total (NSSC FTE)	0.0007	0.0004	.052
Proportion of LBOTE students	-0.0336	0.3551	.925
Index of Community Socio-economic Advantage (ICSEA)	-0.0021	0.0013	.107
Average NAPLAN Reading scaled score	0.0096	0.0085	.257
Average NAPLAN Numeracy scaled score	-0.0076	0.0069	.271
Constant	0.6029	1.1827	.610

Table A9:**Means and standardised bias, before and after matching, permanent beginning teachers sample**

Variable	Unmatched			Matched		
	Term 1	Terms 2-4	Bias	Term 1	Terms 2-4	Bias
Previous teaching experience	5.49	4.59	-33.5	4.90	4.79	-4.1
Part-time employment status	1.08	1.07	-3.9	1.08	1.07	-5.2
Remoteness						
Major cities	0.73	0.80	15.8	0.78	0.76	-3.3
Inner regional	0.16	0.12	-11.3	0.14	0.14	0.0
Outer regional, remote or very remote	0.11	0.08	-9.4	0.08	0.10	4.6
Enrolment – total (NSSC FTE)	590.12	713.48	34.4	643.98	644.16	0.0
Proportion of ATSI students	0.09	0.08	-1.4	0.09	0.09	1.0
Proportion of LBOTE students	0.35	0.37	6.1	0.34	0.36	7.3
Proportion of female students	0.49	0.51	15.5	0.50	0.50	-0.9
Index of Community Socio-economic Advantage (ICSEA)	994.34	994.00	-0.4	987.58	991.17	4.0
Average NAPLAN Reading scaled score	488.19	501.41	20.9	493.47	493.14	-0.5
Average NAPLAN Numeracy scaled score	487.26	502.13	19.7	491.69	492.68	1.3

Author: **Sara Rahman and James Finn**

Centre for Education Statistics and Evaluation

GPO Box 33, Sydney NSW 2001, Australia

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