

Inflow of new teachers into the public system

Martin Gustafsson
31 May 2018

1 Introduction

This short report provides provincial and national values relating to one of the Action Plan indicators, namely indicator 14, which reads as follows: *The number of qualified teachers, aged 30 and below, entering the public service as teachers for the first time during the past year.* The current report describes to some extent the methodology used to obtain the statistics, though more details in this regard are provided in two earlier reports of this kind, produced in 2009 and 2015¹. The current report uses data going up to 2017.

2 The data

Persal data for all educators across all provinces for the years 2004 to 2017 were used. For each year, data for one month were used. The months were not completely consistent, but all fell in the range of September to November. The qualification variable (REQV) was not available in the downloads of all years. The data situation is reflected in the following table.

Table 1: Data inconsistencies

Year	Month	REQV values available?
2004	Sep	Yes
2005	Oct	Yes
2006	Oct	Yes
2007	Oct	Yes
2008	Sep	Yes
2009	Sep	No
2010	Oct	No
2011	Oct	Yes
2012	Oct	No
2013	Nov	Yes
2014	Oct	Yes
2015	Nov	No
2016	Nov	No
2017	Nov	Yes

3 Imputation of missing qualifications values

Note that even where REQV values were available for a particular year, they were often missing for some individual educators. For the indicator in question, a key concern is whether the educator was qualified or not in a particular year. Anyone with REQV 13 or above is supposed to be considered qualified, though young joiners are expected to have REQV 14, in line with the current university training system. The rules for imputing the qualified (value 1) or not qualified (value 0) values, where they were missing, were as follows (this analysis was run separately for at least REQV 13 and at least REQV 14:

- If there was no value for any year for the educator, the value remained missing.
- If there was a value 0 (unqualified) in an earlier year, and there was no value 1 (qualified) for an earlier year, the value would become 0 in the current year.

¹ *Teacher supply patterns in the payroll data* (date 9 March 2009) and *Inflow of new teachers into the public system* (17 March 2015).

- c. If there was a value 0 in a future year, and there was no value 1 for the educator for any future year, the value would become 0 in the current year.
- d. If after following the above steps there were still missing values and the educator was marked as qualified in any year, then the missing value would become 1 (qualified).

4 Methodological and data issues

4.1 The extent of multiple entry

What prevents a straightforward use of just two years of Persal data at a time when calculating indicator values, is the fact that some educators enter more than once. Someone may appear as a joiner in 2005, then be absent during 2006 and 2007, and reappear as a joiner in 2008. To illustrate, analysis of the data indicated that 5.9% of the 589,230 people who were educators in the 2004 to 2014 period, entered the system more than once in the years 2005 to 2014, where entering the system once means being absent in the previous year and present in the current year. The great majority of this multiple entry manifests itself in two entries. 5.3% of the 589,230 educators entered twice during the period in question. The phenomenon of multiple entry means that examining joining whilst using the data from just two consecutive years is likely to result in an over-estimation of the number of joiners. This strengthens the justification for using data from as many years as possible for any one educator, as is done in this report.

4.2 REQV data problems

The reports that precede this one referred to problems with delayed updating of the REQV qualifications variable in Persal. Educators are appointed, but often it takes months or even years before the correct REQV value is entered on Persal. In the meanwhile, the value remains missing. There also seems to be an impression that non-qualified values (REQV 12 and below) are sometimes inserted on Persal pending an inquiry into the educator's qualification status. These issues obviously create problems for anyone trying to track the number of joiners to the public system who are qualified. The imputation of qualifications values described above would to some degree deal with the problems, but less so for more recent years. If an educator has recently joined, and data entry delays have resulted in no insertion of any qualification value in Persal, then there would be no imputation. However, it seems as if the problem with delayed entry of REQV values is less serious in recent years than it was when the 2009 report was written.

4.3 Temporary versus permanent

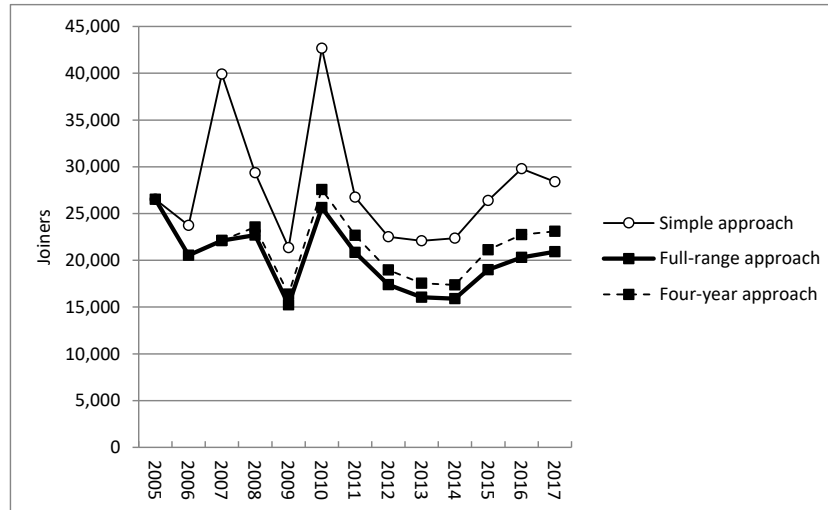
The fairly large extent to which educators are employed on a temporary basis suggests that indicator 14 values must take into account temporary appointments, and not just permanent ones. To illustrate, in 2014 10% of educators were employed on a temporary basis.

5 Results

Figure 1 below provides three different measures of joiners. In the 'simple approach', anyone who was not in the system in the previous year but was present in the current year is counted as a joiner. Given multiple entries, this measure would clearly over-estimate joining as many people would be counted more than once. The curve 'full-range approach' illustrates joiners who were not present in any earlier year (of the years for which data were available). Using this measure could also result in an over-estimate of joining, in particular for earlier years. For instance, a joiner in 2005 would be classified a joiner if she was not present in the data in 2004. However, we do not know whether this person was present in 2003, in which case she should ideally not be counted as a 2005 joiner. For later years, however, one is less likely to

encounter this kind of problem. The ‘four-year approach’ involves looking at just the previous three years, and if the person was not present during those three years, but was present during the current year, the person would be a joiner for the current year. The measure starts in 2007, because the earliest data are from 2004. Though this third measure can also result in an over-estimation of joining, its advantage is that the method is the same for each year, so it is possible to compare the trend over some years (specifically the 2007 to 2017 trend).

Figure 1: Effect of multiple entry on joiner statistics



So what relevant trends are seen in the previous graph? Clearly we should use the second or third measure, but given they are not too different from each other, it is not terribly important which of the two we use. The number of ‘first-time’ joiners per year has been uneven, within the range 15,000 to 25,000 roughly. The earlier 2009 report had argued that the public system needs to attract at least 10,100 new educators each year. This is simply to maintain the existing stock of educators, without any expansion. That threshold would change over time as attrition and the number of employees reaching retirement age fluctuates. It is not the intention of the current report to analyse this. The actual inflow has never been lower than 15,000 since 2005, and exceeded 20,000 in 2017. This seems positive, particularly if one considers that since around 2011 provinces have faced severe budget constraints, making it difficult to hire more teachers, or even replace departing teachers.

What is striking is the continuous decline between 2010 and 2014, followed by a continuous increase between 2014 and 2017. The following table breaks the ‘Four-year approach’ statistics from Figure 1 down by province, which can assist in interpreting the declines and increases. KwaZulu-Natal and Eastern Cape were major drivers of the 2010 to 2014 decline, with Gauteng and Eastern Cape being major drivers of the post-2014 increase. Two provinces have not seen strong increases in the intake of new educators post-2014: Free State and KwaZulu-Natal. One can speculate that budget constraints reduced the intake in Eastern Cape during the first period, and Free State and KwaZulu-Natal in the second period. It is likely that a combination of enrolment increases and relatively good planning and management of the budget have driven Gauteng’s recent contribution to the creation of more employment for teachers. These are speculations, however, and should ideally be investigated further.

Table 2: All joiners 2007-2017 regardless of age

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EC	3,466	3,394	3,497	4,684	1,017	629	584	813	1,473	2,562	2,159
FS	1,201	1,369	554	1,255	2,292	1,659	1,329	1135	1,500	1,469	1,102
GP	3,795	3,636	3,213	6,352	3,666	3,939	3,870	3890	4,994	4,799	6,227
KN	6,705	6,945	3,931	7,721	7,705	6,690	4,693	4882	4,680	5,860	4,533
LP	1,964	2,900	1,593	2,496	2,316	1,197	1,368	1396	1,619	1,874	2,238
MP	1,672	2,006	1,022	1,518	1,178	1,447	1,177	1399	1,695	1,715	1,844
NC	664	655	368	382	390	490	1,196	622	861	721	893
NW	961	384	781	1,241	2,418	1,157	1,478	1390	1,531	1,591	1,709
WC	1,693	2,265	1,430	1,915	1,689	1,759	1,840	1849	2,772	2,142	2,405
SA	22,121	23,554	16,389	27,564	22,671	18,967	17,535	17,376	21,125	22,733	23,110

Note: A four-year approach was followed, meaning for instance that for someone to be a joiner in 2007, they should not have been present in Persal in 2004, 2005 or 2006 (hence four years of data were considered).

Ideally, the bulk of the new inflow should consist of young teachers. Figure 2 below repeats two of the curves from Figure 1 for educators aged 30 or below in the year of entry. Over the longer term, the inflow of younger teachers has grown faster than the overall intake. This is a positive trend. Yet by 2017, fewer than half of joiners were young – only 57% of them were age 30 or below.

Figure 2: Effect of multiple entry on young joiner statistics

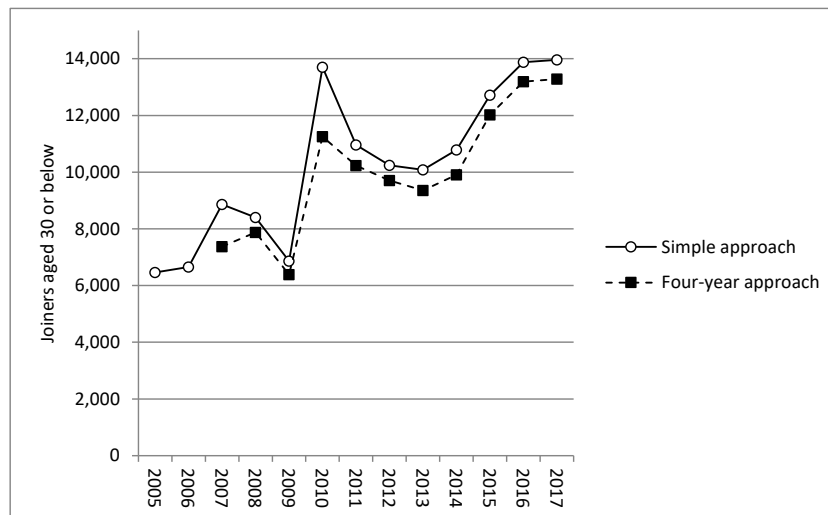


Table 3 below breaks the ‘Four-year approach’ series from the previous graph down by province.

Table 3: Young joiners 2007-2017

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EC	745	859	1,142	1,948	440	366	327	485	855	1,230	1,157
FS	415	467	268	612	767	1,083	811	860	1,026	1,046	788
GP	1041	955	1,081	1,794	1,488	1,819	1,937	2,047	2,667	2,844	3,606
KN	3,760	3,859	2,460	4,621	4,658	3,634	2,917	2,960	2,779	3,405	2,616
LP	195	339	259	511	760	500	656	664	833	990	1,178
MP	366	452	302	556	564	720	606	797	827	1,027	1,077
NC	202	230	164	164	190	228	369	304	457	392	414
NW	158	117	184	294	537	451	662	720	895	1,002	1,028
WC	488	594	523	751	825	903	1,069	1,070	1,681	1,258	1,423
SA	7,370	7,872	6,383	11,251	10,229	9,704	9,354	9,907	12,020	13,194	13,287

Note: A four-year approach was followed.

Figure 3 illustrates the breakdown of the ‘four-year approach’ curve from the previous graph, by qualification status. Here ‘best ever is REQV 14’ means the educator has REQV 14 or above in at least one year in the range 2004 to 2017, and ‘best ever is unqualified’ means that the educator had REQV values, but all below the REQV 13 threshold, while ‘missing throughout’ means there was no qualification data for the educator from any year. For young educators, REQV 14 should be considered the minimum requirement, while older teachers may have REQV 13 and still be considered qualified. The problem of missing values is clearly seen. Earlier reports discussed this in some depth.

Figure 3: Qualifications status of young joiners

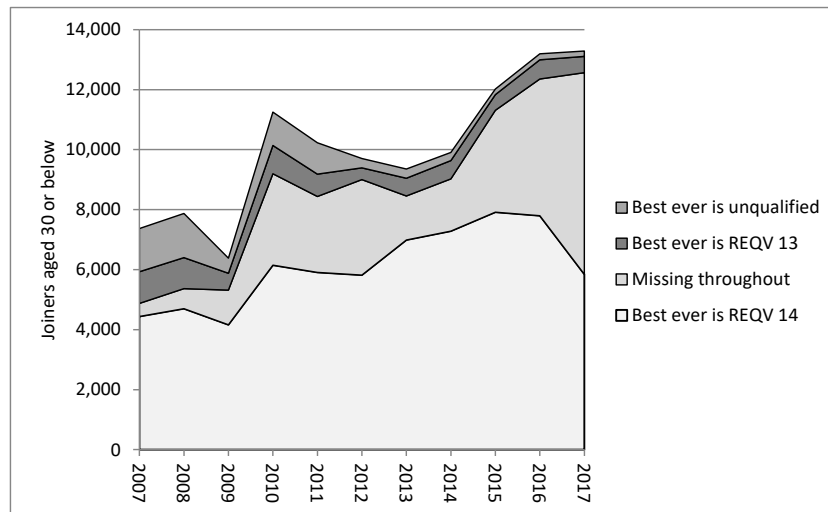


Table 4 below provides the provincial breakdown of the sum of the REQV 13 and 14 (or above) segments from Figure 3. If one compares Table 4 to Table 3 one sees that the percentage of young joiners who are qualified (in the sense of having at least REQV 13) appears to drop, for instance from 75% in 2013 to 44% in 2017. This is not mainly because joiners are becoming less qualified, but because there are delays in updating the REQV value in the Persal data. For any year, the true number of qualified young joiners would be somewhere between the figures seen in Table 4 and the figures seen in Table 3.

Table 4: Young qualified joiners 2007-2017 (under-estimated)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EC	709	798	944	1,352	232	299	199	380	734	940	550
FS	347	380	219	431	529	582	624	534	654	551	295
GP	993	897	860	1,226	1,184	1,384	1,661	1,774	1,792	1,933	1,724
KN	2,185	2,160	1,527	2,241	2,540	1,674	2,243	2,082	2,169	2,293	1,451
LP	153	251	226	356	485	400	598	608	605	535	638
MP	355	432	261	490	437	592	535	743	705	903	856
NC	146	162	131	118	157	163	188	219	249	176	128
NW	151	110	154	238	335	356	589	583	395	425	347
WC	456	543	402	639	754	759	942	971	1,135	681	400
SA	5,495	5,733	4,724	7,091	6,653	6,209	7,579	7,894	8,438	8,437	6,389

Note: Only people who were aged 30 or below in the year in which they were counted appear. A four-year approach was followed. Only educators who at any point (in any of the eight years) had at least REQV 13 or 14 according to the Persal data were counted.

To complete the picture, the following table provides the same statistics as Table 4, except here people of any age were considered.

Table 5: All qualified joiners 2007-2017 (under-estimated)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EC	2,631	2,828	2,940	3,511	643	506	375	626	1,239	1,999	960
FS	1,015	1,094	471	932	1,270	916	950	686	869	759	450
GP	3,292	3,132	2,627	3,706	2,781	2,948	3,174	3,192	3,188	3,140	2,860
KN	3,920	3,797	2,515	3,843	4,407	2,739	3,516	3,346	3,516	3,632	2,363
LP	1,759	2,263	1,408	1,737	1,573	904	1,228	1,271	1,124	980	1,150
MP	1,633	1,773	891	1,345	925	1,204	1,035	1,271	1,402	1,488	1,463
NC	417	494	269	283	318	344	449	388	386	283	217
NW	941	342	680	1,047	1,409	894	1,242	1,100	764	753	633
WC	1,463	1,847	980	1,423	1,413	1,407	1,570	1,592	1,824	1,143	795
SA	17,071	17,570	12,781	17,827	14,739	11,862	13,539	13,472	14,312	14,177	10,891

Note: This is like Table 4, except here there is no exclusion based on age.