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Out-of-field teaching
and teacher workforce data
in Australia

Paul Weldon

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Good morning all. I want to use my time to provide a brief overview of the kind of data that have been collected in Australia. In a sense, I'm setting the scene for ongoing discussion. This session is asking the question, what data are needed to inform policy – what data do we need to collect, and how should we collect it.

I want to inform that debate by describing some of the data that has been collected – how it was collected and what it shows. I also, briefly, want to set that within the larger context of teacher workforce data collection. This is because knowing the prevalence of out of field teaching is only a small portion of the picture. We also need to understand why teachers teach out of field.

I also think that it is important to consider the power that evidence, or the lack of evidence, can have on the story that gets told. So I want to start my presentation with a short tangent.

ABC NEWS

Just In   Watch Live   Coronavirus   Politics   World   Business   Analysis   Sport

Teachers ditching school at alarming rate offered chance to instead excel at Victorian academy

ABC Radio Melbourne / By Isaac Muller

Posted Thu 22 Jul 2021 at 12:44pm

Low wages, short contracts and heavy workloads are driving 40-50 per cent of teachers out of the profession within their first five years, but there are hopes a new academy will help to address the problem.

Australian Education Union Victorian branch president Meredith Peace told ABC's The Conversation Hour that there were teacher shortages in some areas, including in rural and regional areas, and in specialist subjects like maths and science.

"There is a very real risk that if we're not able to attract a new generation of teachers into our schools then we will face significant shortages in the future," Ms Peace said.

Key points:

- Research finds up to half of teachers leave in the first five years on the job
- A union fears significant future teacher shortages
- A new academy will focus on retaining the best teachers

https://www.abc.net.au/news/2021-07-22/victoria-contracts-workloads-teacher-shortage/100307708

A recent ABC news item raised the alarm about 40-50% of teachers leaving teaching in their first five years.

It's an intractable problem. Every year there are stories in the media about this high proportion of teachers leaving, and not a few academic papers make the same point.

So, how do we know that 40-50% of early career teachers are leaving?

Evidence, and nuance

- How many early career teachers really leave?
- Does one number mean anything? I.e. Are there differences?
  - Primary vs Secondary (and by subject area)?
  - Metropolitan vs Regional, low vs high SES?
  - Men vs Women, Sector, State
- Why do they leave?
- How many return? Or move between sectors?
- Do the numbers leaving change over time?
- Which policies aimed at this issue actually work?

The short answer is, we don't. We don't collect that data nationally, or even by state. A state government, or a state catholic sector may have some internal data, but if so it isn't public.

I raise this because the lack of data has led to assumptions being made for which there is no evidence. The lack of data also leads to an oversimplified conversation. If we had real data, we wouldn't be using a single figure because the teacher workforce is more complex than that. At the very least, there is likely to be a different attrition rate between primary and secondary teachers – and probably very different reasons for those attrition rates as well.

Perhaps most importantly, without real evidence, we can't know if any policies aimed at lowering attrition rates are working.

Evidence, and nuance

- What is out of field teaching?
- How many teachers are teaching out of field?
  - Does this differ by subject area, location, SES, school size etc.
- Why are they teaching out of field?
- What are the consequences
  - For teachers
  - For students
- What policies aimed at this issue actually work?

The same reasoning applies to out of field teaching.

Thankfully, in this space the conversation is already nuanced, there has been some data collection and we have real evidence on which to build policy responses.

As Linda mentioned, the definition of out of field teaching is complex, and how we define it will have an impact on the data we collect – on the proportion of teachers judged to be out of field.

Definitions of being in-field

- To be **in-field** (for the *Staff in Australia's Schools Survey*, agreed by SiAS steering committee):
  - **Either** studied the subject at second-year tertiary level or above, **or** trained in teaching methodology for that subject at tertiary level

  (Weldon 2016 alternatives):
  - Studied the subject for at least one semester at second-year tertiary (with or without methods)
  - Have **both** second-year tertiary **and** methods

  ➢ *Not based on registration requirements*
  ➢ *Does not consider experience*

So here are some definitions that have been used in Australia to date. The staff in Australia's schools used a broad, nationally agreed definition of what constituted being in-field. In my 2016 paper, I looked at what the figures would be if that definition was tightened.

Registration requirements differ from state to state, so these definitions are one option of collecting national data. And at this point, the definitions we have here are mostly based on initial qualifications and don't take experience or professional learning into account.

Proportion of Y7-10 teachers in/out-of-field (SiAS 2013)
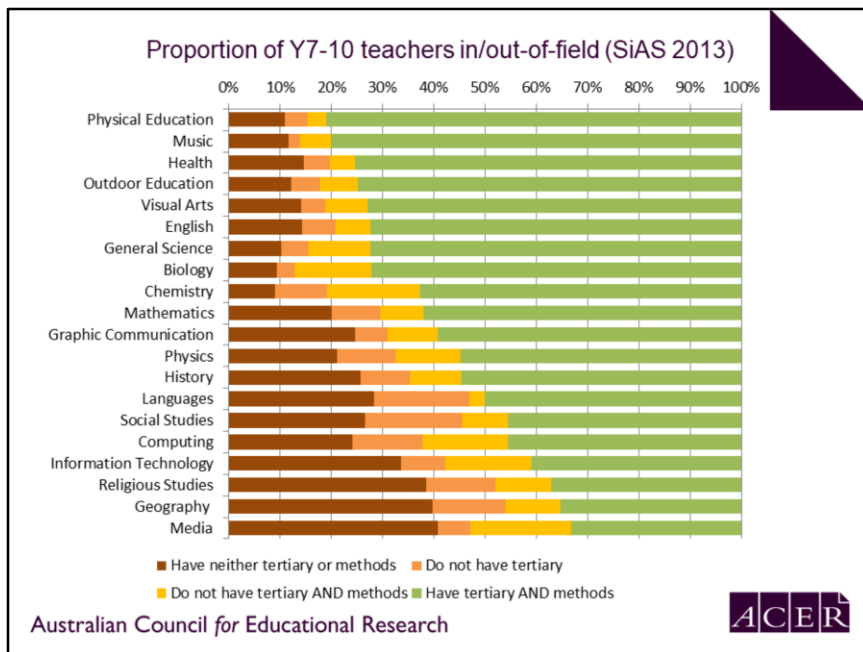
In this slide, I present the proportions of teachers who are in or out of field for each subject, based on SiAS data and the three definitions from the last slide.

You can see that the more tightly you define what it is to be in-field, the higher your proportion of out of field teachers will be.

Proportion of Y7-10 teachers in/out-of-field (SiAS 2013)

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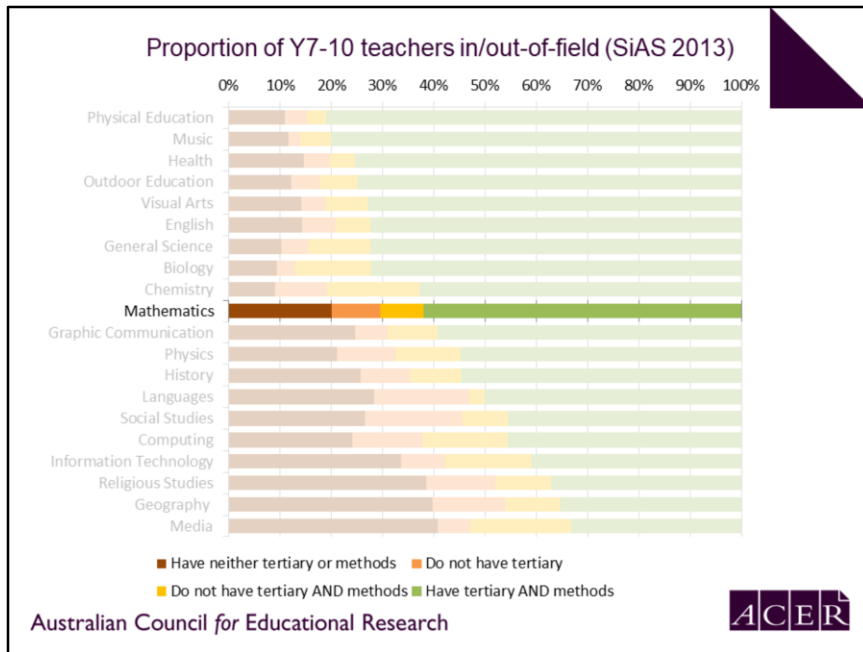
Taking maths as an example, the number of teachers considered out of field very nearly doubles based on the definition used.

Proportion of Y7-10 teachers in/out-of-field (SiAS 2013)
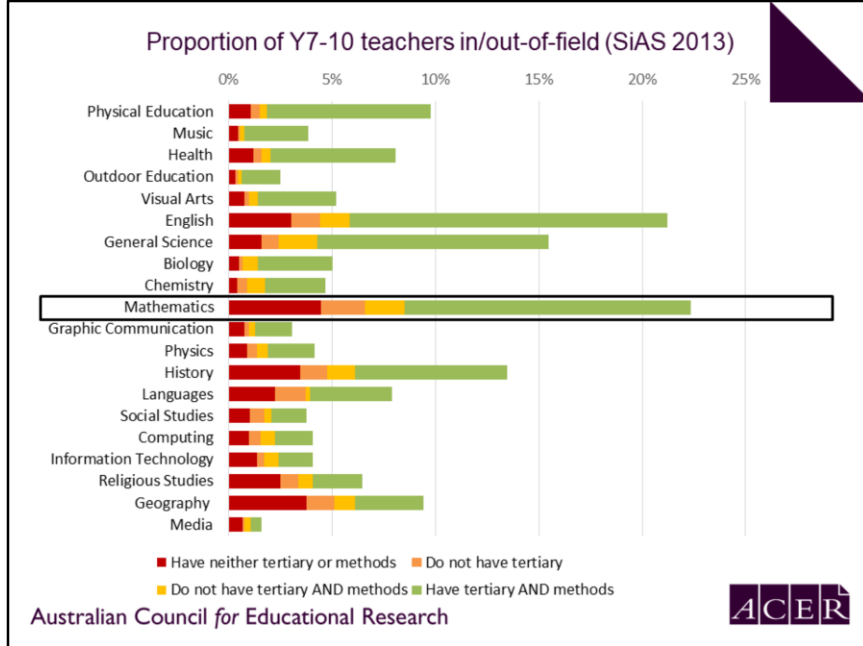
In this slide, I present the same data based on the number of teachers in all subject areas.

As you can see, there are more teachers teaching maths and English than there are other subjects. This means that in terms of actual numbers, maths has the most out of field teachers.

From a policy perspective, we noted in the SiAS 2014 supplementary report that bringing in more qualified maths teachers would reduce out of field teaching across all subject areas, as the most common subject taught out of field is maths.

Definitions of being in-field

- To be **in-field** (Programme for International Student Assessment (PISA) 2015):
  - Subjects are included in teacher education or training programme or other professional qualification

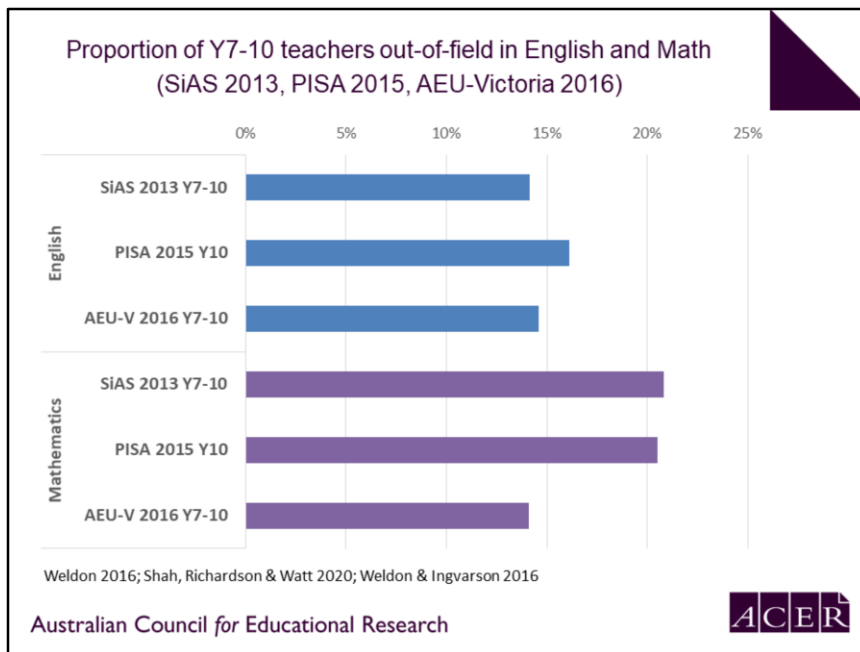 ➢ Not based on registration requirements
  ➢ Does not consider experience

I have two other definitions of being in-field. This one is from PISA 2015 and again is quite broad and mostly concerned with initial qualifications.

Definitions of being in-field

- To be **in-field** (Australian Education Union workload survey (Victoria) 2016):
  - **Either** completed at least one year of tertiary studies and completed tertiary study or professional learning in methods.
  - **Or** have been teaching the subject for two years or more and feel comfortable/capable teaching to current year level

  ➢ *Not based on registration requirements*

The final one is from a workload survey we did for AEU Victoria. This one deliberately included teacher experience and perception, allowing teachers who had been teaching a subject for at least two years and who did not feel that they were out of field to indicate that they were in field.

Proportion of Y7-10 teachers out-of-field in English and Math (SiAS 2013, PISA 2015, AEU-Victoria 2016)

Weldon 2016; Shah, Richardson & Watt 2020; Weldon & Ingvarson 2016

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This slide shows the proportions of out of field teachers for English and Maths based on the original SiAS definition, the PISA definition and the AEU survey definition. Bear in mind that each sample is of a slightly different cohort.

The AEU survey was based on a definition more broad in scope than the other two, so it is interesting that the proportion of out of field teachers in English was much the same as the others. In maths, fewer teachers considered themselves out of field once experience teaching the subject was taken into account.

Data collection methods

- Surveys (current teachers)
  - SiAS (Australian, large sample, most subject areas)
  - PISA (International, ongoing, limited subject areas)
  - TALIS (International, ongoing, limited subject areas)
  - Other (e.g. AEU)(occasional, combined subject areas)
  - Australian Teacher Workforce Dataset (survey, TBC)

Before I present some more analysis of out of field data, I want to take a moment to consider collection methods.

As I said, there is a broad set of teacher workforce data that are relevant to the area of out of field teaching. But when it comes to collecting data about out of field teaching itself, I think the only plausible method is by survey.

This is because teachers are allocated their subjects at the school level, and these allocations are likely to change year on year, if not by semester or even term. In addition, the data at school level is unlikely to be linked to teacher qualifications, professional learning or experience in a given subject. So we need to ask teachers themselves what subjects they are teaching and what qualifications and experience they have.

This could be simplified if the survey is run via the teacher registration bodies, as they would already have some of the information required, which may shorten the survey for teachers. The forthcoming Australian Teacher Workforce Dataset may have taken advantage of this option.

Broader data collection options

- Initial Teacher Education providers
    - Graduates by subject (potentially), census, ongoing
- Registration bodies
    - Registered teachers by subject (potentially), census, ongoing
- National teacher ID card?

42% of undergraduates did not complete their ITE qualification
21% of postgraduates did not complete their ITE qualification
(ITE Data Report 2019)

How many ITE graduates actually join the teacher profession?
How many teachers really leave the profession? When and why?
Do these differ by subject area?
What ramifications would this have on policy decisions?

That brings me to the broader questions that have relevance for out of field teaching. For example, The ITE data report can tell us how many secondary teachers graduate each year. What it can't tell us, however, is how many teachers graduated in maths, or English, or any other subject area.
(This is what I said in my presentation. In fact, the AITSL 2020 ATWD pipeline report did, for the first time provide some information on the subjects graduating teachers are qualified to teach, although only 51% could be accurately identified in the 2020 report. See https://www.aitsl.edu.au/docs/default-source/atwd/reports/new-pipeline-report/2020_aitsl-atwd_pipelinereport.pdf from page 132)

This data is available – universities keep records of qualifications by subject and the Victorian Teacher Supply and Demand report does include this data, which helps us understand how many teachers are graduating by subject, which is necessary if we want to target policies to those areas with shortages.

Similarly, registration bodies could record this data, although only NSW does at present. This would help us understand what the pool of currently registered teachers is qualified to teach, and how it changes over time.

Proportion qualified and not teaching, and teaching in/out-of-field
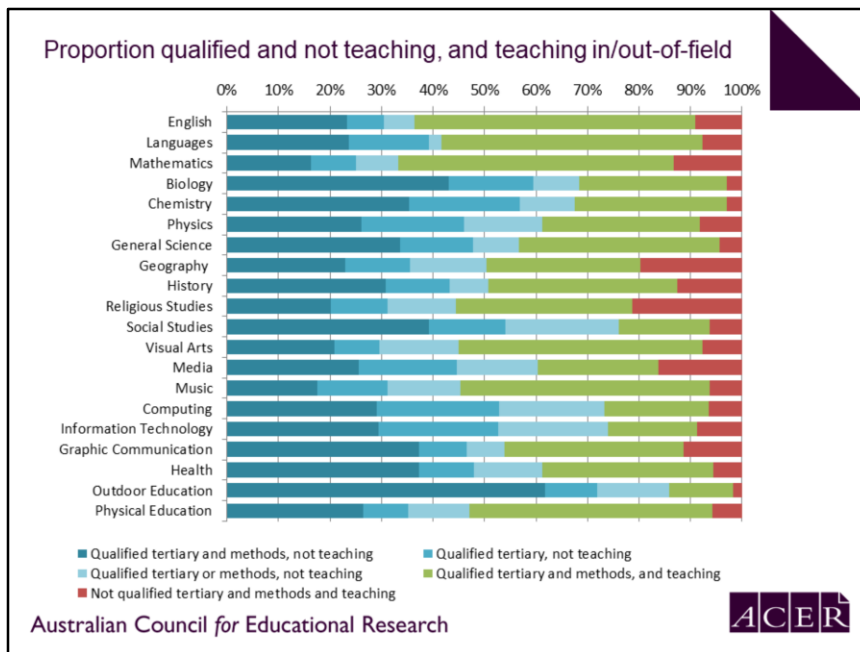
From a supply and demand perspective, understanding teacher qualifications, registration, employment and attrition by subject area would help identify areas for policy decisions.
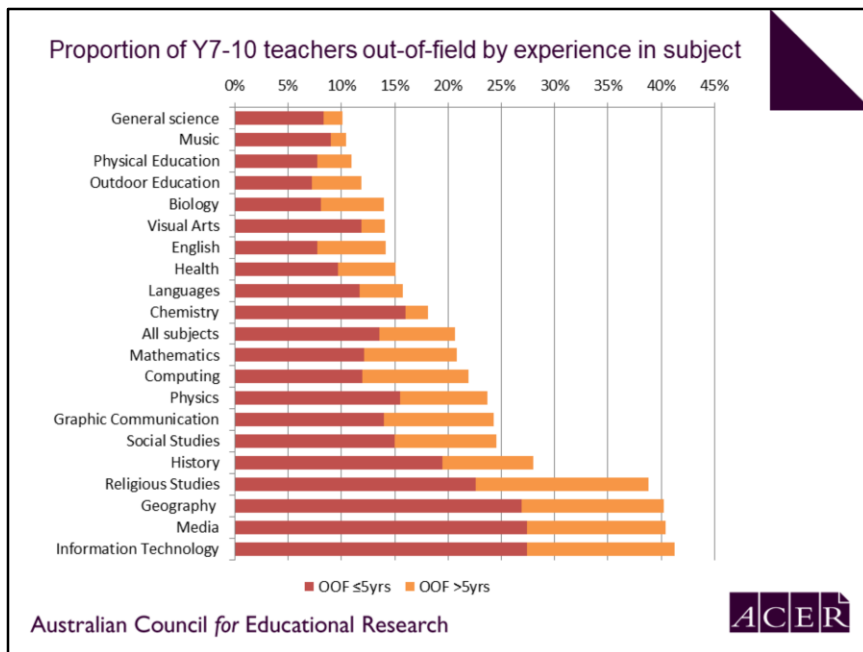
But this is not the whole story.

The SiAS data collection was particularly useful in that it was able to ask teachers several different questions, regarding what they were qualified to teach and what they were actually teaching at a point in time.

This chart shows that there are far more teachers qualified in a subject who are not teaching it than there are teachers who are teaching it out of field.

This slide demonstrates that the distribution of teachers within schools plays a role in the need for out of field teaching. It is also the case that most teachers are qualified in two or more subject areas so, for example, a teacher qualified in English and History may be teaching English in field and some social studies out of field, and no history at all.

Another example - a given school may have several qualified maths teachers, but there may still be one class of Year 7 students that isn't covered, so there will still be one teacher teaching maths out of field – and that may be the case even if there is another qualified maths teacher at the school not teaching maths because there is no one else to teach Year 11 information technology.

So the point here is that even if there were no teacher shortages in any subject, schools can only afford a certain number of teachers, and depending on the mix of qualifications of that school's teachers, the complexities of timetabling means that there is likely to always be some teachers teaching out of field, and this will be more common in smaller schools with fewer teachers.

Proportion of Y7-10 teachers out-of-field by experience in subject

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From a data collection perspective, it is better if we can ask a set of questions, such as qualifications, experience, current teaching load, and so on. But more questions means a longer survey, which is why the survey for the AEU included experience in the definition of in-field teaching.

In the SiAS survey, we were able to ask these questions separately for each subject. So this slide shows the amount of experience teachers had teaching specific subjects out of field.

On average, teachers teaching English out of field had been doing so for over 8 years, and out of field maths teachers had been teaching maths on average for over 7 years.

This is where the definition of what is teaching out of field becomes complex. The nature of professional learning makes it difficult to quantify in surveys. Professional learning could include a three hour seminar or a unit of a masters degree.

Teachers may have taken multiple informal courses on teaching methods in a subject they are not formally qualified to teach. Unless they have taken a formally recognised qualification, such as a graduate certificate or masters degree, their professional

learning is unlikely to be recorded in a survey that asked them to list their formal qualifications.

And the varying quality and quantity of their professional learning outside formal qualifications would be hard to quantify in a survey format – even assuming that a teacher would be able to list everything they had attended over a period of several years.

It is also the case that experience in itself can't tell us much. There could be a large difference between an out of field maths teacher who has been teaching the same year 7 maths curriculum for 7 years, and one who, in their 7 years of experience, has taught year 7 for one year, then year 9, year 8, year 7, year 10, and so on.

This complexity is why I would suggest that one option is to record straightforward survey items, such as formal qualifications and length of experience, but it is also useful to ask teachers for their own perception – whether they are comfortable teaching any given out-of-field subject. I acknowledge that there is a difference between confidence and competence, but it might help to know how many teachers are out of field according to an accepted formal definition, and what proportion of those are uncomfortable teaching that subject, compared to those who have experience and support and feel that they are competent.

(about 13.30)
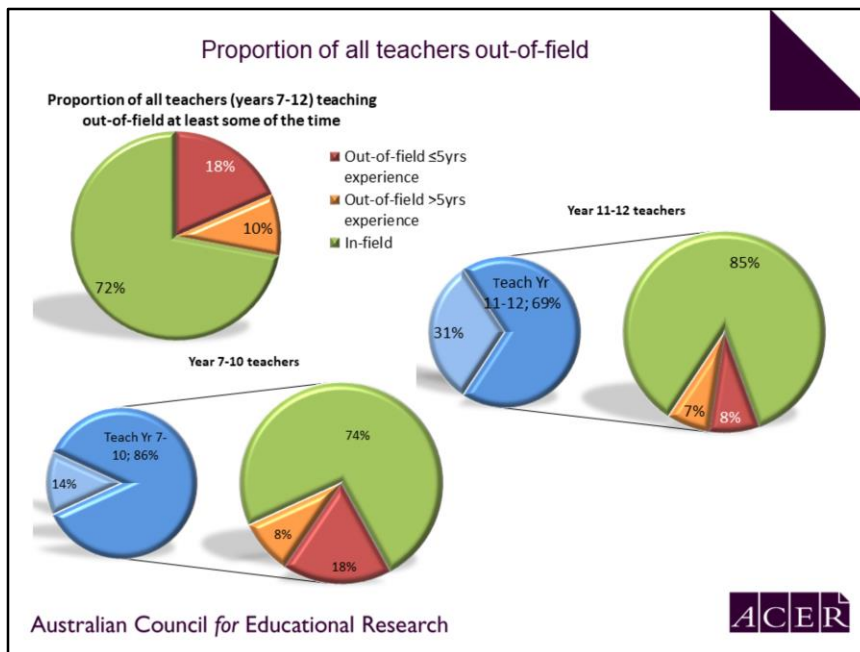
The definition of out of field teaching remains an important issue for ongoing discussion.

However we choose to define it, the data that can be collected can help to build a nuanced picture of what is happening in schools. I will have to move through the next slides briefly, but they will show you the kind of information that can be provided.

This slide shows that over one quarter of all teachers were teaching out of field at least some of the time. This is data based on the SiAS survey, so is a snapshot of teachers in Term 3, 2013.

Out of field teaching is more prevalent at years 7-10 than years 11-12. About one quarter of teachers teaching years 7-10 were teaching out of field some of the time, compared to 15% of those teaching years 11-12.

Proportion of teachers out-of-field by location
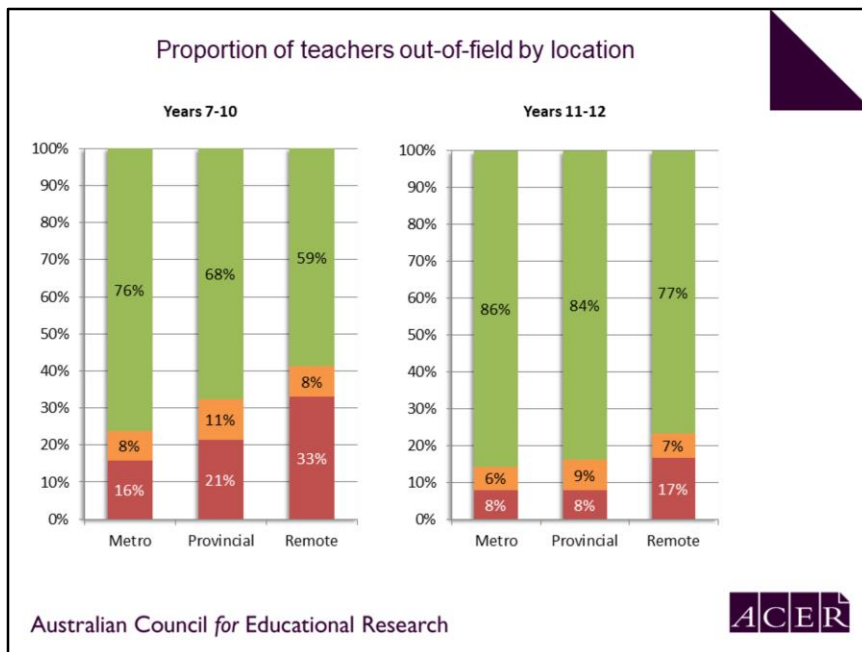
The 2013 data also showed that out of field teaching became more prevalent the further away you move from metropolitan areas. As noted previously, this is at least in part due to higher proportions of small schools, which employ fewer teachers, although it is also the case that higher proportions of principals in regional and remote areas reported unfilled positions.
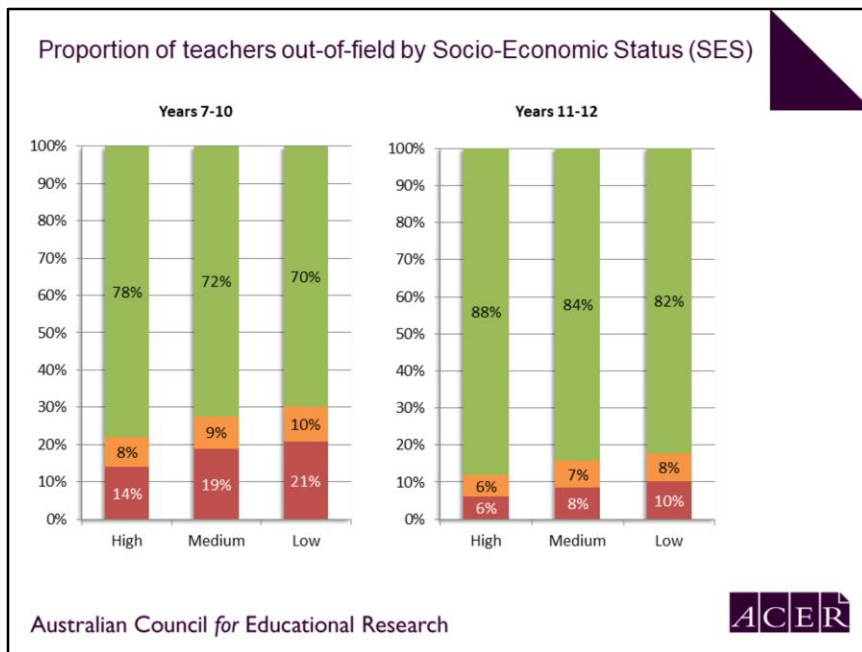
Similarly, schools serving more disadvantaged communities tended to have more out of field teachers. It is the case that regional and rural areas tend to be more disadvantaged than metropolitan areas so there is a degree of overlap between this slide and the last one.
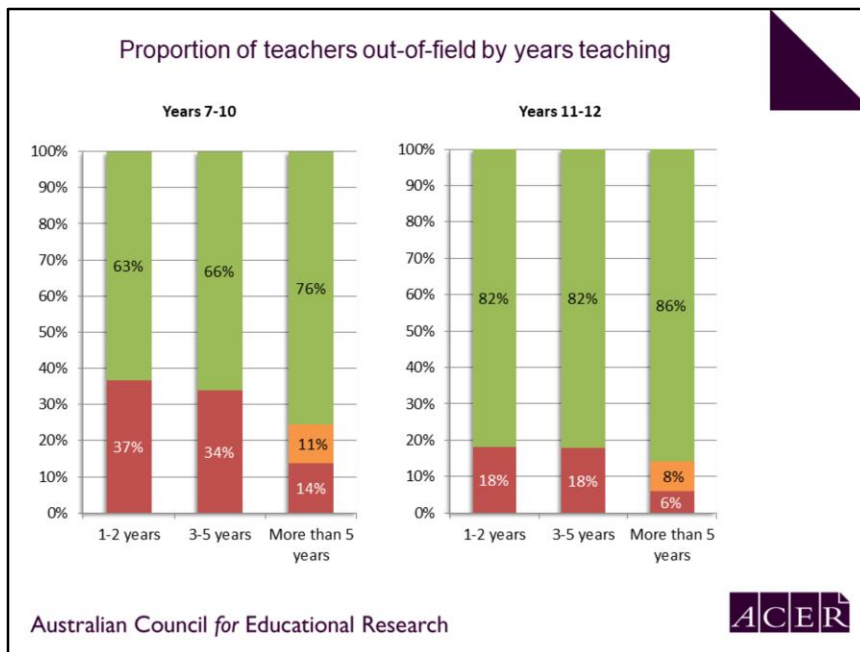
This slide neatly brings me back to the tangent I started with. Based on the 2013 SiAS survey, early career teachers were more likely to be teaching out of their subject areas than their more experienced colleagues. Over one third of teachers in their first two years of teaching were teaching at least part of their load out of field.

It is worth noting that, at this level of disaggregation, this data is not representative. But it is indicative. One way of improving the retention of early career teachers may be to ensure that they do not have to teach outside their specialist areas for the first two years or so of their teaching career.

Teachers teaching, and class groups taught out-of-field
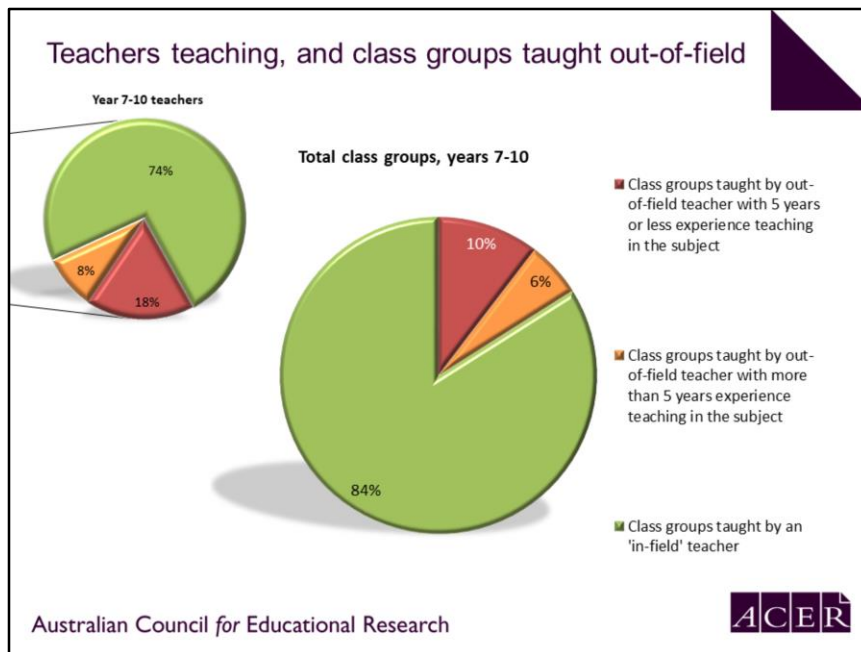
One area I haven't yet mentioned is the impact of out of field teaching. I have just suggested that there may be an impact for early career teachers, and it is important to consider its effects on teachers – something others will consider in more detail later in this summit.

But we also need to understand how out of field teaching might affect students.

The SiAS survey also asked teachers to indicate how many classes they were teaching, across all the subjects they were teaching at the time.

Teachers tend to have a lower allocation in an out of field subject than in their other subjects. So while about one quarter of teachers were teaching out of field, that did not mean that one quarter of classes were being taught out of field. The SiAS data showed that about 16% of classes were being taught by an out of field teacher.

Proportion of Y7-10 class groups taught by out-of-field teacher By years of experience

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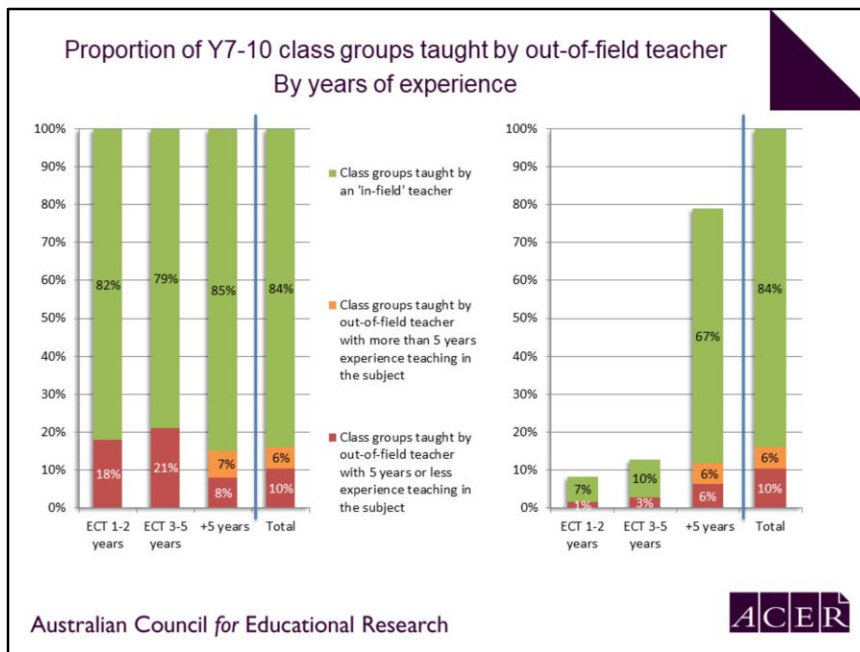
It is also worth noting that proportions can be misleading if not put into perspective. So I mentioned that about one third of teachers in their first two years were teaching out of field. In terms of the number of classes they were teaching, as a proportion of all classes taught by teachers in their first two years, the proportion is lower, at 18 per cent, as you can see on the left chart.

However, when you consider teachers in their first two years as a proportion of all teachers, - the chart on the right, - the exact same data shows that they are only teaching about 1% of all year 7-10 classes out of field.

This kind of data can give us an indication of how many classes, and how many students, are being taught by an out-of-field teacher. It is much harder to gauge the impact of out of field teaching on student performance. To do that, we would really need student based data that could follow how many classes a given student had in a given subject with an out of field teacher, and how regularly.

I would have said that we don't have that kind of data at present.

Australian OOF data: Where to from here?

The Sydney Morning Herald

Exclusive National NSW Teaching

One in six teachers working outside their area of expertise, documents reveal

By Jordan Baker
Updated October 7, 2021 — 3.56pm, first published at 3.30pm

More than 100,000 NSW high school students are being taught by someone without expertise in their subject due to increasing teacher shortages in areas such as maths, science and even English and history, confidential documents show.

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https://www.smh.com.au/national/nsw/one-in-six-teachers-working-outside-their-area-of-expertise-documents-reveal-20211007-p58y28.html

So I was somewhat surprised to read a recent piece in the Sydney Morning Herald, which revealed that the NSW Department is collecting some data in this area.

NSW Government figures

- \>100,000 students taught by OOF teachers
- Students with in-field teachers achieved higher HSC
- 14% secondary teachers teaching OOF
  - 22% Y7-10, 12% Y11-12 OOF Maths teachers
  - ~20% Junior high English & History teachers OOF
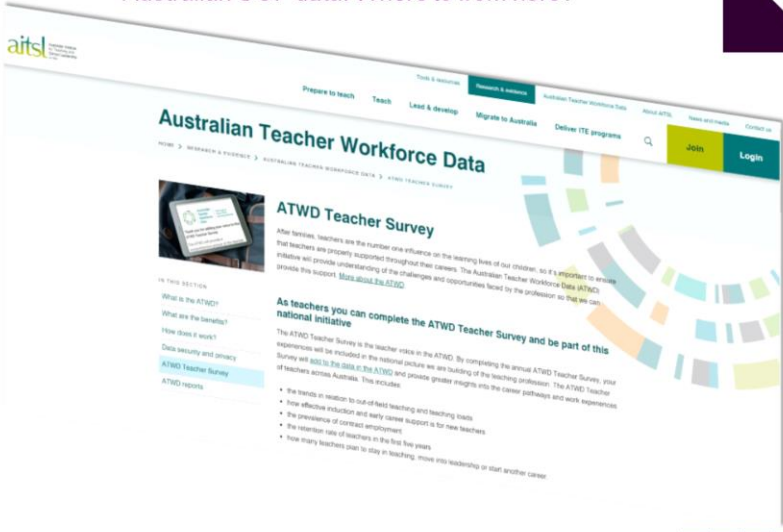
"The most heavily impacted areas were maths and science, with 22 per cent of years 7-10 maths teachers and 16 per cent of years 7-10 science teachers unqualified. Special education is also faced with a severe shortage of qualified teachers."

Some of those figures were much the same as they were in 2013 – 22 per cent of maths teachers is almost exactly the same, but 16% in science is higher than the 11% SiAS found for general science at years 7-10. English, which was 14% is higher, while history, which was 27%, is lower. Of course, SiAS was national, while this is NSW government school data.

More interesting was the commentary that students with in-field teachers achieved higher HSC scores in some subjects.

These documents have not been made public, so currently we don't know what kind of data or modelling was used. The proportions of out of field teachers is not unexpected, but we would need more information on how teacher numbers have been linked to student numbers, and particularly how they have been able to collect data on the proportion of classes in a given subject students have had with an out of field teacher, and how they have calculated the effects on student achievement. It would also be interesting to know what definition of in-field teaching was used.

So I want to end with– where to from here?

The SiAS survey didn't run again after 2013, but the results of the first ATWD survey managed by AITSL is due out in the near future and it will be interesting to see what has been collected.

I hope too, that the NSW government will share some of their methodology and findings more broadly, as this would further the conversation about what data can be collected, and how best to collect it.

Thank you.

Notes:
I didn't have time to note in my presentation that we do now have some teacher attrition data – see Wyatt and O'Neill 2021 for WA government sector data: https://www.sciencedirect.com/science/article/abs/pii/S0883035521000240?dgcid=rss_sd_all#!

My presentation was based primarily on the following:
Weldon 2016: https://research.acer.edu.au/policyinsights/6/