**WORKING MEETING ON FORECASTING
THE NEEDS FOR TEACHING WORKFORCE**

7-8th November, 2017
Vilnius, Lithuania

BACKGROUND

Given the high average age of current teachers and low current admission rates to initial teacher training (ITT) programmes, it is expected that there will be an undersupply of teachers in Lithuania in the near future. Moreover, shortage is already evident in specific teaching fields such as Chemistry and Physics. There is therefore a need to systematically estimate and forecast the demand and supply of teachers on the basis of socio-economic and demographic trends, which will allow determining the admission quotas to ITT programmes. At the current juncture, there is no clear system to determine the number of teachers needed in the future and ITT students to be admitted.

Reliable estimations will help addressing the current mismatches by allowing a better planning of the admission quotas to teacher programmes, and the design of possible incentives to encourage students' enrolment in teacher's initial education or to university graduates to accept teachers' position. Reforming the teaching profession is one of the main priorities of the Lithuanian current education policy as the Government has undertaken a reform of the career and professional training system for teachers. The 2017 Country Report for Lithuania confirms teachers' quality as a key driver to tackle the low performance of the education system and points at the low attractiveness of the teaching profession for young talented people.

The initial goal of the working meeting was to present example on teacher workforce planning systems from other EU member states and provide Lithuanian representatives with the first set of recommendations regarding the design of teacher planning system in Lithuania. Below two set of outcomes are given: a short overview on the best practice from Ireland and England; recommendations regarding the teacher workforce planning system in Lithuania as an output from the discussions held during the working meeting.

BEST PRACTICE

IRELAND

Demographic and economic context

Four years ago, Ireland was emerging from a very serious recession and there was a high unemployment rate. It was reasonable to anticipate that all teacher programme graduates would stay in Ireland and take up the available teaching posts. Since then, the economy has boomed again; unemployment rates have plummeted; there is a baby boom and renewed inward migration. Ireland became more culturally diverse – it is estimated that between 10% and 15% of school-going population were born outside Ireland. In some schools the proportion of newcomer children can be as high as 50%, which provides new challenges for teaching society. There is a shortage of housing, especially in the cities and

therefore teachers cannot afford to live in the cities. Countries in the Middle East (e.g. Dubai, Saudi Arabia etc) are offering very attractive financial packages to entice Irish teachers to emigrate there. As a result of these unanticipated factors, Ireland has a shortage of NQ (newly qualified) teachers this year.

Initial teacher education (ITE)

Until 2012, there were several teacher education providers all around the country. Following a policy of rationalisation, there are now six Initial Teacher Education (ITE) centres of excellence that provide research, best practice, support and leadership in teaching and education. All teachers must complete at least a Bachelor's degree. The entry to ITE is highly competitive, attracting those in the top academic 15%. Prior academic performance is the key criterion used for entry to most ITE courses. Initial teacher education (ITE) programmes are provided separately for primary and second-level teachers. Most primary teachers complete a four-year (240 ECTS) programme, but some complete a consecutive postgraduate two year programme. Most post-primary teachers complete a two-year Masters degree in Education (120 ECTS), following a Bachelors degree (180 ECTS) in a specific subject or subjects.

The Ministry for Education controls the number of students admitted to initial teacher education courses for primary teachers. There is a *numerus clausus* for each provider. The Ministry does not control numbers of students admitted to courses for second-level teachers. Each provider decides how many students to accept. Most consecutive second-level ITE providers for second-level teachers do not select on a subject-specific basis. This can result in under- supply of teachers in some subjects and over-supply in others. "The Review Panel's vision for the structure of ITE provision in Ireland is that by 2030 Ireland will have a network of teacher education institutions based on a small number of internationally comparable institutes of teacher education. Each of these institutions will offer research-based teacher education in internationally inspiring environments." (A Review of the Structure of Initial Teacher Education Provision in Ireland, 2012).

Teacher supply

The Technical Working Group (TWG) was set up following an agreement between the Department of Education and Skills (DES) and the Teaching Council that an analysis of arrangements for the planning of the teacher workforce in Ireland should be undertaken. The initial concentration of the TWG has been to seek to provide projections for a model for primary teacher supply while outlining the necessary work which will be required to establish a similar model for the more complex work required at post-primary level (Striking the Balance, 2015). The Ministry for Education has been advised that there needs to be a Standing Committee or Group which meets regularly to check the Forecasting Model to monitor its effectiveness and to continually scan the economic, social and cultural horizon for factors which might affect the model. For example, in Ireland in the past year some factors have occurred which were not anticipated when the intake into teacher education programmes was approved four years ago.

Challenges

Projecting the supply and demand for post-primary teachers is more difficult than for primary teachers. There are different categories of post-primary schools that provide the same

curriculum regardless of school type. About 60% are individually managed; 25% are managed by regional education boards, and 15% are community or comprehensive schools, individually managed. In addition, post-primary schools employ teachers on a permanent, or contractual or part-time basis. Other issues concerning projecting teacher supply: pupil enrolments will rise steeply in coming years; teachers of certain subjects e.g. Gaeilge, Home Economics and Modern European Languages, are in short supply; an oversupply of teachers of History, Geography and English. Teacher education providers (i.e. universities) have autonomy to decide on student enrolments, including their subject specialisms.

Additional resources:

- Striking the Balance. Teacher Supply in Ireland: Technical Working Group Report. The Teaching Council, December 2015.
- A Review of the Structure of Initial Teacher Education Provision in Ireland. Background Paper for the International Review Team, May 2012.

THE UNITED KINGDOM

The Teacher Supply Model for England

The Teacher Supply Model (TSM) is used by the Department for Education in England to estimate the number of postgraduate initial teacher training (ITT) places needed each year and meet the demand of newly qualified teachers (NQT). The model is used to allocate ITT places to providers and to assess how well the department has been performing in recruiting teachers and to model ITT bursaries. For example, the 2018-2019 TSM estimates ITT place requirements for the 2018-2019 training year. The scope of the model covers state-funded primary and secondary schools, including academies and free schools in England. Independent, special, Scottish/Welsh (have their own separate systems) and other schools are 'out of scope' but are covered indirectly. The model is established and used for over a decade. There is an internal steering group and an external technical user group.

The TSM is a stocks and flows model, where stocks can be described as number of teachers there are now and in the future, flows – the number of teachers expected to leave the stock (require replacement) and number of teachers expected to enter teaching profession. The model uses historical and current data to inform of what is going to happen in the future and bases assumptions on evidence and data. The TSM accounts for: pupil numbers and demographic changes; numbers of teachers leaving; teacher demographics; new policies; teachers entering the stock via different routes other than as NQTs; not all trainees completing training and gaining posts in the state-funded sector in the following year. User testing for Pupil-teacher ratios, pupil projections and other inputs are available.

Data sources

The model uses several information sources. The School Workforce Census provides data on current stock, its demographics and subject information as well as data on teacher flows and their routes. Econometric wastage projections – forecasts on how wastage rates are expected to change over time from current levels - are used from an external Econometric Wastage Model. Another model output, pupil population projections, is used in the TSM.

Other data such as share of trainees that complete ITT and share of those successfully enter teaching posts afterward is used.

Key assumptions

There are several key assumptions being made in the modelling process. One important assumption is on the future Pupil:Teacher Ratios (PTR) – the TSM uses historical data on PTRs and pupil numbers to make assumptions as to how PTRs (and therefore teacher numbers) will change in the future. Historically PTRs have risen and fallen as pupil numbers have. Part of the additional demand for teachers in the past has been met by increasing PTRs, and therefore class sizes. Different assumptions for primary and secondary PTRs are made. Numbers of secondary teachers in each subject using pupil numbers and subject-level teaching & teachers' data are estimated.

English Baccalaureate (EBacc) was introduced in 2010 to prevent the fall in the number of students studying foreign languages and science. To enter the EBacc, pupils are required to take GCSE-level examinations in English Language and English Literature, Mathematics, two or three science subjects, History or Geography, and an ancient or a modern language. The 2017/2018 TSM included a planning assumption of increased EBacc take-up from 'current' levels up to 70% for GCSE examinations in the summer of 2020. The 2018/2019 TSM uses an assumption that take-up rates will increase up to 75% for GCSE examinations in the summer of 2024. These assumptions change impacts upon Modern Foreign Languages (MFL) – MFL teaching does not need to increase quite so rapidly as assumed before but also effects the non-EBacc subjects. Therefore, EBacc assumptions have had a positive impact on ITT places for the non-EBacc subjects.

Challenges

There are several potential challenges facing the TSM. First to mention is that both primary and secondary pupil numbers are growing. In addition, it may be harder to recruit teachers as the economy is growing and relatively speaking teachers earn lower wages compared to professional averages. As the economy goes down, teacher profession is more attractive since there are less employment opportunities outside teaching. As well, internal teacher movement between schools adds more churn in the system and this is not yet accounted in the model. Previously mentioned EBacc means that more teachers need to be recruited in the subjects that have historically been harder to recruit to.

Additional resources:

- TSM model 2018/2019 https://www.gov.uk/government/statistics/tsm-and-initial-teacher-training-allocations-2018-to-2019
- English Baccalaureate https://www.gov.uk/government/consultations/implementing-the-english-baccalaureate

RECOMMENDATIONS

There are 8 predetermined challenges that concern teaching workforce planning system in Lithuania. The discussion on these eight challenges was raised and more detailed issues as well as possible solutions were given as a background for the discussion. The initial goal of the discussion was to receive recommendations on the teaching workforce planning system scope, level of detail and other essential elements. Below, recommendations provided by the working meeting experts and participants for each raised challenge are given.

1. ANALYSIS SCOPE

CHALLENGE	RECOMMENDATIONS AND REMARKS
Education level (pre-school, general, vocational education)	• **It is recommended to cover all 3 different education levels and provide rough estimations for vocational education rather than very detailed forecasts.** • There are teachers trained in HE programmes that teach general education classes in vocational schools, thus it is important to include teachers working in vocational schools even though pupil population in vocational schools is quite low (approx. 10% total). Vocational educ. teachers are required to have secondary education and a special course. • TSM model leaves out special need schools since the requirements for schools and teachers are different.
Staff type (teaching and management positions)	• **It is recommended to look at teachers only and include other staff duties in the future by looking at how schools employ different staff members and how that affects school budget.** • If the imbalance is in the teaching profession only – modelling should be focused on that. • TSM models teachers only. TSM takes into account teaching (contact) hours only even though some teachers have other duties at school.
Forecast length	• **It is recommended to provide a 1-year projection for same year admissions to ITT programmes and a 4-year (the length of one ITT) forecasts to determine future teacher need. A longer but less accurate forecast on pupil population would be useful to have.** • TSM provides 3 types of forecasts: 1/2-year (to make sure that enough teachers are trained in the next year to meet the need for the following school year), 5-year (the length of the Parliament, policy assumptions), 12-year (only pupil number changes). • The forecast for primary teachers in Ireland covers one pedagogical training cycle (4 years) even though multi-annual projections would be ideal. • The monitoring process must be ongoing to respond to unexpected shocks by, for example, opening a 1-year long ITT program to cover teacher shortages.

2. LEVEL OF DETAIL

CHALLENGE	RECOMMENDATIONS AND REMARKS
National/ regional/ municipal level of detail in modelling steps output	• **As a starting point, national level estimations should be projected and then, depending on how different the regions are, projections on regional level should be made based on various regional statistics (likelihood of retirement, employment level, other).** • If municipality data is available and would provide statistically significant outcomes – it is recommended to use it. • TSM team only recently started looking to regional projections (10 regions), there do not seem to be any massive differences between the regions. • Students can get employment in any region not only in their graduation region. If there is historical or any other evidence on graduate employment location – it is recommended to use this information in the model. At one point, we want a decision on which regions have a higher need of teachers.

3. WORKLOAD DEFINITION AND TEACHER QUALIFICATION IMPACT ON CONTACT HOURS

CHALLENGE	RECOMMENDATIONS AND REMARKS
Change in the payment scheme anticipated; Workload is defined differently for teachers and other staff members.	• **If there are differences in subjects by number of hours taught per week or a subject is more likely to be taught part time, this has to be taken into account. If subject or a group of subjects becomes compulsory that is obviously going to affect hours needed.** • Newly implemented full-time pay scheme will define a new range of [12, 24] contact hours per teacher (to be announced). This could be considered by providing different scenarios for min/mean/max or selected value of contact hours per teacher. • To determine the headcount need, average hours per subject should be projected forward and corrected depending on the pupil number projection (more pupils – more hours). There are teachers that work in different schools but data on their individual records per school is available. • Low number of total hours per location may imply that the school network is not efficient. Planning system could be used as a tool to help principals in making decisions on school workforce needed and as well improve managerial skills. Newly implemented teacher planning system may set grounds to changes in mindset and provide transparency in policy making.

4. STRUCTURAL CHANGES IN EDUCATION SYSTEM

CHALLENGE	RECOMMENDATIONS AND REMARKS
Shifts in pre-school and primary education starting age; changes in education content (curriculum) such as integrated subject implementation.	• **A change that is already known or is likely to be an issue has to be included in the model. Ideally, we would not like to redesign the model every year, of course, minor changes are unavoidable.** • If a new policy is being considered, the team could be asked to include it in the model to anticipate the implications it might possibly have. That is a big advantage in policy making. That is common practice in England by using TSM. • TSM does not assume school openings or closures because it is just too unclear how would that impact the projections. • All policy assumptions that are used by TSM are already agreed on and known to the public (transparent and open process).

5. CHANGES IN PEDAGOGIGAL STAFF TRAINING SYSTEM

CHALLENGE	RECOMMENDATIONS AND REMARKS
Different and changing lengths and types (consecutive, concurrent, professional) of ITT programmes.	• **If scenario testing is possible, different lengths and types of ITT programmes should be tested.** • Have proportions for graduates coming from different types of training programmes and then change these proportions. • Important to think in advance how changes in ITT structure would have an impact on teacher supply, rather than changing the model later, when the change occurred.

6. TRENDS IN ADMISSION, DROP OUT AND GRADUATE EMPLOYMENT RATES

CHALLENGE	RECOMMENDATIONS AND REMARKS
Changes in ITT admission system; drop-outs.	• **Take a simple proportion of how many of those entered completed their studies and then – how many got employed. TSM has it as a flat figure going forward. An average of, for example, last three years could be taken.** • In case of, for example, scholarships to ITT enrollers introduced, we need to have an idea how that might impact the projections, thus again, use scenario testing.
Forecasting ITT graduate employment; other economic factors.	• **Use country-level macroeconomic forecasts provided by, for example, Bank of Lithuania to determine what might happen to graduate employment rates. An assumption is that when economy is getting worse we expect more teachers to stay in their jobs since there are less employment opportunities outside teaching profession.** • Run a regression to see factors of economy that are relevant. Keep it simple and give few scenarios. TSM has 5-6 scenarios available (pupil/teacher, pupil number, EBacc scenario, unqualified teachers, and training numbers). • One option to encourage graduate employment level is to have study programmes with an orientation year, after which students decide whether

	they want to take industry or teaching path and pick their study modules (courses).

7. STAFF TURNOVER

CHALLENGE	RECOMMENDATIONS AND REMARKS
Turnover rates: teacher requalification training; early pension schemes.	• **If the turnover is a problem, then a turnover percentage has to be added to the model as an assumption. If young teachers tend to leave more or if data by subject is available – model can be broken down to subject level.** • There is a disincentive for a teacher to switch professions because requalification is required to enter teaching after 3 or more years of absence. • If there is an oversupply, a mandatory induction period for graduates could be introduced. If there is an oversupply in specific subject areas, teachers could be sent to gain new competences in other subjects. • In some point in the future, the turnover might become an issue when the teacher age-profile will change and mean teacher age will decrease. There is a high turnover rate in England, since teachers are on average younger and young professionals tend to switch between jobs more.

RECOMMENDATIONS ON SYSTEM STAKEHOLDERS

- In order to develop a comprehensive teacher planning system, stakeholders should be consulted and involved throughout the project.
- The obvious stakeholders are the Ministry officials, representatives of the employers, school administrators, teacher unions, and the initial teacher education (ITE) providers (e.g. universities). There may be other stakeholders whom can be identified. The more engagement with stakeholders the better. Any forecasting model will benefit from a wide range of inputs.
- One way of doing this is to set up a Consultative Forum which might meet less regularly than the Forecasting Group.
- Ireland proposes to have a Standing Committee which will meet regularly to monitor the Forecasting Model. There is an internal steering group and an external TSM technical user group in England.