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In Finland, skills anticipation activities are well-established and linked to policymaking. Over recent years, socioeconomic factors such as the effects of the economic recession, the gradually decreasing number of people in the labour force, and the ageing population increased the need for better matching between the skills supply and demand. As a result, significant investment in skills anticipation has been undertaken. The aim is to steer the education system – both vocational education and training (VET) and higher education (HE) – to meet the needs of the labour market. This is being achieved by making skills anticipation more comprehensive, with input and feedback from the government (central, regional and local) and increasingly also from stakeholders including employers, trade unions, and labour market intermediaries as well as education institutions and their staff and students. Skills anticipation takes into account sectoral, occupational and geographical differences, and includes skills assessments, skills forecasting, skills foresight, and employer surveys.

The core tools of skills anticipation in the country are the VATTAGE and MITENNA models. The VATTAGE model, the cornerstone of skills anticipation in the country, provides forecasts up to 2025 based on a model of the Finnish economy, while the MITENNA model provides the basis of anticipation of education needs and future oriented development of education.

The Finnish National Agency of Education (Opetushallitus, EDUFI)[1], under the Ministry of Education and Culture (Opetus ja kulttuuriministerio), plays a key role in anticipation activities and is supported in this role by the Skills Anticipation Forum (Osaamisen ennakointifoorumi), established in early 2017. The Forum replaced and took over all the tasks of the former Education Committee System of the Ministry of Education. Under an ongoing reform of the VET system, quantitative forecasting of educational needs will be improved.

In general, there is a high degree of stakeholder involvement in skills anticipation activities. Major trade unions, employers, regional councils, and representatives of educational institutions are involved in anticipation exercises. The responsibility of education providers for anticipating and responding to the labour market changes has increased, as operational targeting and steering powers have been devolved to universities, polytechnics, and VET providers. Providers are required to play an active role in addressing the national/regional labour market skills needs.

In addition, a wide range of national and regional EU-funded anticipation and foresight projects are carried out by organisations such as research institutes, labour market and industry organisations, VET providers, universities, and polytechnics. In particular, regional anticipation activities have developed rapidly in recent years. Key players in regional anticipation include regional councils, the Centres for
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ENKO (Commission consortium of long term labour and education need forecasts) with representatives from Ministries of Education and Culture (MoEC) and of Finance; Ministry of Economic Development, Transport and the Environment (ELY Centres), VET providers, and HE institutions.

Dissemination of the data generated by skills anticipation exercises is an important element of the overall approach. There is a drive to make the outputs from anticipation exercises accessible to a wide audience (policymakers, employers, jobseekers and young people, etc.) through a range of channels including reports, workshops and online publications. Despite the focus on dissemination of skills anticipation data, there is a need to improve the user friendliness of the existing database to better inform students, job seekers and employers.

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- The VATTAGE model, which generates the long term baseline employment forecast;
- The MITENNA model, which estimates the education and training provision required to meet labour market needs (national and regional).

### Governance

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### Description

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Skills anticipation is based on extensive cooperation between ministries, EDUFI, research institutes, regional authorities, labour market organisations, ELY centres, and HE and VET institutions. This approach has several strengths:

- It identifies and quantifies the main macroeconomic impacts on the labour market. It also makes use of national historical economic data as a basis for baseline forecasts;
- It is comprehensive, covering all regions, all levels of education and most occupations, and is thereby useful for planning; (2)
- It provides a common framework for stakeholder cooperation. The main stakeholders include the Ministry of Economic Affairs and Employment, Ministry of Education and Culture, EDUFI, Regional Councils, labour market actors, and education providers.

The Ministry of Education and Culture is responsible for quantifying and targeting education and training provision at national level. Its EDUFI produces national anticipation data on the demand for labour and educational needs, in order to support decision-making. The EDUFI also supports regional anticipation activities, which are carried out under the supervision of Regional Councils. The latter cooperate with the EDUFI, the Ministry of Economic Affairs and Employment and the VATT Institute to develop skills anticipation tools.

The National Education Committee System (koulutustoimikuntajarjestelma), consisting of 26 committees with members from the world of work, education, and other stakeholder groups, was until recently an expert body for the Ministry and the EDUFI. Its activity included qualitative skills anticipation, promoting collaboration between education and the world of work, representing industry sectors and addressing the respective skills needs that anticipation exercises highlight. As of 1 January 2017, the tasks of the Education Committee System have been transferred to the Skills Anticipation Forum of the Ministry of Education and Culture. The aim of this change is to avoid overlapping anticipation exercises; to promote closer interaction between education and labour market actors and to improve impact of skills anticipation. (3) The coherence of skills anticipation is expected to improve through the reduction of the number of industry specific multi-stakeholder collaboration groups from 26 education committees to nine. (4) The EDUFI will implement the anticipation of skills and education needs on the basis of the action plan created at the beginning of the Skills Anticipation Forum’s four-year term.

Other skills intelligence instruments – regular surveys, interviews, databases and statistical estimates of skills needs – are used by regional institutions, education providers, trade unions, employment and economy services (TE-palvelut), ELY Centres, Chambers of Commerce, and independent researchers.

**Aims**

Skills anticipation policy in Finland aims to steer the education system towards meeting labour market skills needs by taking into account sectoral, occupational and geographical differences. The main aims of the skills anticipation system are to:
Prepare forecasts concerning economic growth and employment;
Anticipate the medium and long-term demand and availability of the workforce;
Anticipate developments in the occupational structure;
Anticipate the educational needs of the workforce;
Estimate the national and regional provision of education places for young people; and
Ensure that young people have access to vocationally/professionally-oriented education and training.

The purpose of quantitative anticipation of educational needs is to offer evidence-based measures and a balanced view of the future (as well as alternative scenarios) as a basis for evidence-based educational planning, operational decision-making, and to generate information on how the education system can support economic development. (5)

The policy focus in Finland is to create a more coherent system in which the main elements of skills anticipation are inter-connected, with enhanced cooperation between stakeholders. The 2017 establishment of the Skills Anticipation Forum is an important step towards this goal.

Legal framework

There is little statutory regulation regarding skills anticipation in Finland. The 2011 Performance Audit Report of the State Audit Office (6) notes that “there is no coherent entity or system of skills anticipation, design and provision of education, and no regulatory framework based on legislation”.

Previously, Government Decree 882/2010 on the Education Committee System (7) prescribed the tasks, composition and working methods of the 26 education committees. Following the transfer of the tasks of the Education Committee System to the Skills Anticipation Forum (8) decree-level steering has been abolished, on the grounds that it had made the Education Committee System inflexible. In the new system, the Ministry makes the decision on the establishment of the steering group and the anticipation groups of the Skills Anticipation Forum and requests the EDUFI to nominate the members of the anticipation groups and organise the anticipation work.

The Finnish National Agency for Education was established in early 2017 by Law (564/2016). The Agency took over the activities of the dismantled National Board of Education (EDUFI) and the International Mobility and Cooperation Centre (Centre for International Mobility, CIMO).

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Prior to 2009, the former Ministry of Labour was responsible for the national labour force forecasts. In 2009, skills anticipation underwent a re-organisation with ENKO (formerly PATKET) (Commission consortium of long-term labour and education need forecasts - taking responsibility for the anticipation of labour force trends and education needs. It comprises representatives from four ministries: Education and Culture, Finance, Economic Affairs and Employment, and Social and Health Affairs.

The 2011 audit has shown that the separation of responsibilities in the anticipation of labour and education demands has generally worked well but that there is a need to ensure better ongoing dialogue
between different branches of government. In particular, it indicated that VATT and ENKO should pay greater attention to the regional dimension in skills anticipation due to large regional differences in labour market developments and the uneven utilisation of regional anticipation results. These comments are increasingly taken into consideration in governance and policy design.

**The role of stakeholders**

In general, there is a high degree of stakeholder involvement in skills anticipation. In order to meet the national anticipation needs, authorities are facilitating collaboration among stakeholders to ensure that (a) the perspectives from a diverse set of anticipation exercises are taken into account in policy development and implementation; and (b) that anticipation methods are being further developed.

In government, the main stakeholders are departments and agencies at the national and local levels (the Ministry of Economic Affairs and Employment, the Ministry of Education and Culture, the National Board of Education and Regional Councils, and the ELY Centres and municipal authorities. Other important stakeholders include researchers, trade unions and employer and education institutions which take part in the skills anticipation process, for example through the Skills Anticipation Forum.

The VATT Institute for Economic Research in Finland is the agency directly involved in skills anticipation. It is overseen by ENKO, which sets the strategic direction for the VATT so that it supports the information needs of various government ministries. Stakeholders are involved in the anticipation process at several stages. As the main stakeholder, the government, through ENKO, provides overall guidance and sets priorities for the various anticipation exercises it undertakes at the national, regional and local levels. Previous evaluations show that the division of responsibilities in the anticipation of labour and education demands have generally worked well.

Nonetheless, there is a need to ensure ongoing dialogue between different branches of government. VATT and ENKO need to pay greater attention to the regional dimension. At the regional level, actors need adequate resources for their anticipation work, and that education institutions take part in skills anticipation activities in order to ensure that anticipation results have a stronger impact on education provision.

The EDUFI is in charge of quantitative and qualitative skills anticipation for steering education provision. The multi-stakeholder Skills Anticipation Forum with nine industry specific anticipation groups supports the anticipation work in practice. The steering group and nine anticipation groups are multi-stakeholder constellations with representatives from employers and entrepreneurs, employees, education and training providers (VET and HE), educational authorities, education staff and students, as well as research and evaluation organisations. Each skills anticipation group takes part in qualitative and quantitative anticipation, to ensure that the education system will provide the necessary skills and competences, and make initiatives and recommendations to relevant actors (i.e. the Ministry of Education, EDUFI, and education providers) regarding curricula content and labour market collaboration. Anticipation groups also enhance dialogue between VET and HE to anticipate and identify skills needs and the pathways between different education institutions. Skills anticipation groups are also tasked with highlighting areas in need of development and make related proposals for R&D.
Education institutions and non-governmental organisations, such as the main trade unions, also contribute to dialogue over skills anticipation. Other stakeholders, such as local and regional level municipalities, employment offices, Chambers of Commerce, ELY Centres, local networks and employers contribute to higher education boards which assess labour market needs, both qualitatively and quantitatively, of graduates. At a regional level, the ELY Centres play an important role in interpreting the results of skills anticipation activities and in liaising with municipalities with responsibility for certain education institutions.

The National Foresight Network, coordinated by the Prime Minister’s Office and The Finnish Innovation Fund (Confederation of Industries), brings together Finnish foresight data producers (ministries, agencies, universities and regional councils, companies, NGOs and researchers) and provides a discussion and coordination forum for national foresight actors. In addition, the network promotes the use of information and futures perspectives in decision-making. A national foresight forum, FinnSight, is annually organised by the Academy of Finland, the EDUFI, the Ministry of Education, Science and Culture, the Finnish Innovation Fund (Sitra), the Finnish Funding Agency for Innovation (Tekes), the Ministry of Economic Affairs and Employment, and the Prime Minister’s Office. FinnSight 2016 focused on the change in the world of work and future learning needs in Finland. It highlighted the need for competence-based learning at all levels of education in order to meet the needs of the labour market and society.

Target groups

Outputs from the VATTAGE and MITENNA models are intended for a wide range of users including policymakers, employers, education institutions, jobseekers, and researchers. The comprehensive nature of these outputs allows different groups to use them for a variety of purposes. For example, local and regional authorities may use them in order to implement central government policy, intermediaries (careers advisors) to advise young people entering the labour market or further and higher education, and researchers to inform their analyses of specific regions, sectors or occupations.

Funding and resources

Funding is usually provided by the institution undertaking the anticipation exercise. Official exercises are funded by the government via its ministries and agencies. These include the Ministry of Education and Culture as well as regional and local agencies. On the other hand, educational institutions fund their own anticipation exercises. ESF funds have been used for several cluster-based anticipation exercises to develop anticipation tools such as the MITENNA model and the VOSE project (see section “Skills assessment”).

Methods and tools

Various tools are currently used to undertake skills anticipation activities in Finland.
Skills assessment

In recent years, about two to three skills anticipation exercises have taken place annually at sectoral level in areas identified by the EDUFI, taking into consideration recommendations of the Education Committees and, as of 2017, by the Skills Anticipation Forum. In contrast to the VATTAGE and MITENNA models, these sector-based assessments take advantage of the qualitative-based anticipation model developed by the National Project on Anticipation of National Competences and Skills Needs (VOSE). (11)

In 2016, skills assessment reports were published on the food chain, retailing, the games industry, and services for the elderly. Results from these VOSE-based skills anticipation activities have an impact on the curricula for VET and HE, particularly for polytechnics (universities of applied sciences).

The VATTAGE baseline model is also used to carry out skills assessments. Skills audits have been carried out in the context of reforming policy on education and training to better respond to labour market needs.

Skills forecasts

Skills forecasting is well-established in Finland, with multiple institutions engaged in various exercises. The baseline forecasts are produced by the VATT Institute of Economic Research for use by government ministries and agencies. The first forecast for 2005-2025 was published in 2010. It is based on the Finnish dynamic CGE-model, the so-called VATTAGE Applied General Equilibrium (AGE) model of the Finnish economy. (12) The forecasts are updated every five years, each time looking ahead with a fifteen-year horizon.

VATTAGE first produces a long-term baseline scenario of economic development based on several macro-economic variables that are considered key long-term drivers of employment. In the second phase, ‘political’ scenarios (alternative scenarios using different assumptions for the variables) are calculated. The VATTAGE model is supplemented with modules relating to sectoral and occupational employment. In the future, regional analyses will be incorporated into the model. Outputs from the VATTAGE model regarding future skills needs feed into the MITENNA model, (13) developed by the EDUFI through which the Ministry of Education and Culture articulates the education and training provision necessary to meet forecast demand.

Sectoral forecasts (toimialaennuste) generated by the VATTAGE model are core to the MITENNA Model. The MITENNA model anticipates long-term educational needs (approximately 15 years ahead) based on labour market needs by calculating changes in labour demand, the number of people exiting the labour market, and the demand for new labour market entrants, while taking skills supply into consideration from all levels of the education system. The anticipation results are updated as new industry forecasts are released, which allows for the development of continuous anticipation data. MITENNA connects various forecasts, expert opinions and education policy objectives in order to anticipate future educational needs. This approach ensures that the results are not based on hypotheses of economic development produced by a single research institute, but on a wider process of future-oriented stakeholder dialogue.
The EDUFI Regions (14) produce their own forecasts on educational needs in their area based on nationwide forecasts and their own estimates for regional development. The regional forecasts aim to develop a robust evidence base for strategic development in regions, municipalities and communities. This information is used by the regions in their strategic planning and by the Ministry of Education when determining the licences to provide vocational upper secondary education and training (and their content). Information is also used in performance negotiations between the Ministry of Education and Culture, the universities and the polytechnics when agreeing on the scope of their educational provision.

Each of the 15 ELY Centres generates regular estimates (qualitative forecasts) of the short-term outlook for key occupations and workforce availability. In these Occupation Barometers (Employment Outlook by Occupation, Ammattibarometri) ELY Centres estimate the demand of approximately 200 occupations, and the balance between supply and demand for next six months, based on interviews with employers and employees, visits to the employers, and data from the barometers. The Occupation Barometer is published twice yearly providing skills anticipation data to the PES, public employment offices, career guidance, and information services at schools, the planning of VET provision, and labour market forecasts. The aim is to improve the match between vacancies and jobseekers, and to promote occupational and regional mobility.

The Ministry of Economic Affairs and Employment (TEM) also publishes short-term labour market forecasts every spring and autumn to inform policy development, based on economic foresight, regional economic reviews and monitoring of labour market recruitment. This forecast draws on a structural time-series analysis based on unemployment statistics, GDP and population data and an economic forecast by the Ministry of Finance as well as population forecasts by the Statistical Centre.

Skills foresight

The baseline scenario produced by VATTAGE is a starting point for several foresight exercises. Most foresight activities have been one-off exercises (e.g. TEKES’ FinnSight 2015 Science and Technology Foresight) while some have run regularly (e.g. Surveys on the Need for Workforce and Training in Enterprises).

Other skills anticipation practices

VET and HE institutions are legally required to develop their own anticipation activities which monitor graduate employment outcomes. These activities are run by programme-specific committees with labour market representation.

HE institutions also run regular employer and alumni surveys and ESF-funded anticipation projects (e.g., the ESF-funded national adult education anticipation project, 2015-2018). These anticipation practices are complementary to exercises described above, but they are limited in scope. National sector-specific Anticipation Groups under the Skills Anticipation Forum (previously Education Committees) also generate and use skills anticipation information as part of their role to propose ways of improving the content of upper secondary VET and HE. (15)
The EDUFI currently runs a national, ESF-funded project, which aims at developing and piloting a forecasting model on the skills needs of the adult population to support decisions on adult education of all forms and levels.

A new skills anticipation tool focusing on VET is expected to be completed in 2018, triggered by a significant reform of the VET system currently underway. The reform affects the way skills relevant to this level of education are anticipated, leading to changes in the methodology and overall approach to skills anticipation. The focus will be on better anticipating skills needs and allowing the forecasting tool to be more responsive to the fast-changing environment.

**Dissemination and use**

In terms of dissemination, the strength of the Finnish anticipation system as a whole, and of VATTAGE and MITENNA in particular, is that forecasts are openly available to the wider public through the EDUFI online database. There users can generate figures and tables. Most of the outputs of the skills anticipation activities are, however, aimed at policymakers and labour market intermediaries (e.g. careers advisors). There is reportedly no user-friendly information service or data portal which would easily allow individuals – employers, students and job seekers – to make informed decisions. There are plans to improve the accessibility and extend the use of the VATTAGE forecasts by, for example, tailoring results to meet the region- and sector-specific needs of employers and policymakers, and making the data available via various media platforms, including an online database.

The TEM analyses are available also online in the form of a publication (16).

**Use of skills anticipation in policy**

Forecasts of future skills demand by sector and occupation have significant influence on policy, especially in education through the so-called KT process (koulutustarjontaprosessi/Education Supply Process). (17) Outputs from the VATTAGE are used in designing national-level education strategies and other government programmes at the regional and local levels. The MITENNA system translates the results from VATTAGE into estimates of required educational provision. These are discussed by the Anticipation Groups (previously Education Committees) at different government levels (national, regional and local) in order to adjust provision according to stakeholder views. The educational estimates are then made into proposals for future targets. (18) This concerns all levels of education after primary, and both general and VET.

The government policy on VET, HE including universities, polytechnics and adult training institutions is affected by skills anticipation outputs. Skills anticipation results have a significant impact on education policy objectives and the targets for education supply. Skills anticipation also affects the performance agreements between HE institutions and the Ministry of Education and Culture which set the priorities and qualitative and quantitative targets (number of degrees).

Skills anticipation also influences curriculum planning in VET and HE. For example, skills needs
anticipated by the EDUFI and the groups of the Skills Anticipation Forum provide an indication as to which types of skills are expected to be in demand in the future, and what knowledge, skills and competences should be part of formal education and training. The results are expressed as descriptions of required skills. This information in turn feeds into the development of course content in higher education institutes.

**Target groups’ uses of skills anticipation outputs**

Skills anticipation data are used by stakeholders for planning and steering work at the national, regional and institutional levels. Target groups for the skills anticipation exercises include young people (school and VET leavers entering the labour market, or higher and further education), employers, jobseekers, policymakers and intermediaries such as career guidance providers.

Skills anticipation data are also used by the PES for guidance and employment counselling to provide information on future employment opportunities. Public employment offices, for example, direct jobseekers towards sectors with demand on the basis of local forecasts and the exchange of information between regional actors.

The outputs of skills anticipation are also used by local actors (municipalities, educational institutions, public employment services, and others) to influence the education provision policy within their jurisdictions.

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**Bibliography**

The following sources have been drawn upon in preparing this report.


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### Endnotes

1. EDUFI, The Finnish National Agency of Education (formerly FNBE, Finnish National Board of Education, Opetushallitus), is a national development agency responsible for pre-primary, basic, general upper secondary, vocational upper secondary and adult education. The EDUFI is subordinate to the Ministry of Education and Culture. In 2017, EDUFI and the Centre for International Mobility (CIMO) merged to form a new agency with a focus on learning development.

2. For further information on the VATTAGE model (in English), see Honkatukia J. 2009.

3. The Final Report of the evaluation by Öival Group Oy is available at:


7. Valtioneuvoston asetus 882/2010 koulutustoimikuntajärjestelmästä (Government Act 882/2010 on training committee system)

http://www.oph.fi/koulutus_ja_tutkinnot/ammattikoulutus/koulutustoimikunnat/103/0/koulutustoimikkunnista_osaanimen_ennakointifoorumiks


10. ELY Centre is the regional level of the Ministry of Economic Affairs and Employment


12. The dynamic AGE model was developed by the Centre of Policy Studies in Monash University in Australia. In addition to Finland, Monash-type models have been used in China, South Africa, the United States, Denmark and the Netherlands. For more information on VATTAGE, see Honkatukia, 2009.

13. The MITENNA model is described in Hanhijoki, I. et al. 2012.
The MITENNA model is described in Hanhijoki, I. et al. 2012. The EDUFI webpage for anticipation includes a list of regional anticipation with weblinks: http://oph.fi/tietopalvelut/ennakointi/koulutus_ja_osaamistarpeiden_ennakointi/alue_ennakointi


Available in Finnish only under ‘TEM-analyysia’.

KT is the Finnish acronym for ‘Koulutustarjonta’ i.e. “Education provision working group” which submitted its proposal for quantitative targets 2016 in 2011. The proposal was based on a scenario for the development of value added and employment in different branches of industry published by the Government Institute for Economic Research (VATTAGE). This proposal was a basis for the development plan for education and research for 2011–2016. See Ministry of Education and Culture. 2011.