



Data-Driven Strategy for Further Education

21st Century FE Challenges

Further education (FE) colleges in the UK are facing the same challenges as similar workforce-oriented institutions across the globe:

- A continuing, broad mission of academic and workforce preparation, as well as community development and enrichment
- Increased demand from employers to produce workforce-ready, mid-to high-skill graduates for the new “knowledge economy”
- A rapidly changing economy that continually requires new focus areas and new skills
- Fast-rising enrolments as society pushes more young people toward college and ageing workers seek new skills
- Larger minority and immigrant populations entering the workforce
- Sluggish growth in funding and the need for higher government prioritisation

These challenges will require new strategies and tactics. Most importantly, they will require colleges to have a new awareness of economic, workforce, and population trends in order to better engage both learners and employers.

EMSI’s mission is to meet this need with powerful information solutions that tame the complexities of economic and workforce research, transforming statistics into relevant, actionable intelligence for FE colleges. These solutions are currently used by more than 230 colleges in the United States, and are now being introduced to the United Kingdom.

FE colleges in the UK will be able instantly to understand their regional economies and craft informed responses to changing economic landscapes. Colleges can use information to engage employers, match training to workforce needs, focus and sharpen their educational mission, and demonstrate their value to regional stakeholders.

Transforming Data into Information

Economic data has great potential applications for FE, but implementation presents significant challenges. Accessing the data in a format that is detailed and useful enough for your institution can be complicated by the limitations of publicly-available datasets. These limitations include:

- *Fragmentation*: Individual datasets each focus on particular aspects of the economy, leaving the researcher to manually integrate a dozen sources to paint a complete picture.
- *Varying levels of detail*: Different sources of information have very different levels of detail for geographic areas, industries (types of economic activity), and occupations (types of workers). This makes the work of integrating data sources quite complex.
- *Methodological differences*: Different sources have varying methods of data collection and varying definitions for the information they cover, leaving the researcher to sort them out manually in order to ensure valid comparisons and conclusions.
- *Format*: The data are often available only in raw text or database formats that require extensive processing before they can produce presentation-ready information. In some cases, necessary information is not publicly available at all, and researchers may have to request customised tabulations.
- *"Suppressions"*: Some detailed, local data are censored from public data sources to ensure confidentiality. While this is a necessary step to protect businesses' information, it leaves researchers with "holes" that need to be filled with estimates or additional inquiry.

These issues significantly hamper researchers seeking to harmonize the information from these sources. To get at the data your institution needs to create an informed, intelligent strategy workforce education strategy for your region, you need a data set that overcomes these challenges.

That's why EMSI has compiled more than 15 leading UK data sources to create a single dataset that leverages each source's unique strengths and mitigates its limitations. EMSI's sophisticated approach addresses all the above issues and removes the technical obstacles to accessing usable information, thus adding significant value to government statistics.

EMSI data gives colleges access to an unmatched level of information about each region's industries, occupations, and demographics by filling in major data gaps with informed estimates. And with Strategic Advantage, its suite of sophisticated web-based analysis software, EMSI gives colleges a powerful interface to interact with the data and extract the most important information relevant to their communities' challenges.

Three Crucial Questions EMSI Can Answer

FE Need	Applicable Information
What types of employers should we engage concerning workforce needs?	<i>Industry data</i> : dominant, foundational, competitive, and emerging industries in the region.

How can we better align our program offerings to jobs in demand?	<i>Occupation data:</i> recent trends and projections for employment by category
How can we better understand our community's diverse population to market our programs and increase the inclusion of minorities and ageing workers?	<i>Demographics:</i> Local population by ethnicity, age, and gender

An Overview of EMSI Data

Geography

All EMSI data has a local focus; it is tied to specific geographic areas. But UK statistical geography is notoriously complex, owing to the number of different boundaries that serve different purposes (census, administration, health services, etc.). Furthermore, these boundaries have changed, sometimes significantly, over time. This situation complicates data cross-comparison and aggregation, especially when taking into account historical information and creating projections.

To create a more useable, accessible geographic context for its dataset, EMSI relies on Eurostat NUTS (*Nomenclature d'Unites Territoriales Statistiques*) area definitions, which aggregate economic statistical areas into different levels of geographic detail. In each European Union nation, NUTS areas are divided into three levels:

NUTS 1 areas correspond roughly with England's Government Office Regions (GORs) and the UK's constituent countries (Scotland, Wales, and Northern Ireland).

NUTS 2 areas generally group several counties and unitary authorities

NUTS 3 areas are approximately equivalent to individual counties, Unitary Authorities (UAs), or small groups of UAs. Within NUTS 3 areas are Level-1 Local Administrative Units (LAU1), which are typically either a district or single unitary authority.

By adopting this geographical structure for its data set, EMSI creates a unified, easy-to-understand framework for economic data. We currently offer industry and occupation data for 11 NUTS 1 areas (England's 9 GORs, Scotland, and Wales) and all the NUTS 3 areas contained by them. Our demographic data is slightly more detailed geographically, extending to the LAU-1 level for England, Scotland, and Wales. We currently do not have data for Northern Ireland.

Understanding Industries

Economies are driven by industries, so understanding industries is crucial for developing a regional economic and workforce strategy. In the context of economic statistics, industries are categories of economic activity that allow statisticians to generalise the economic activity of an area by grouping similar “local units” of business. A local unit is generally equal to a physical location of business; a large corporation or enterprise may have many local units in various regions. Local units in the UK are classified by their “primary” economic activity and placed into hierarchical categories defined by the United Kingdom **Standard Industrial Classification** of Economic Activities (SIC).

EMSI industry data is structured around these hierarchical SIC codes, which have four digits, each representing a level of detail. EMSI publishes 4-digit level industry data, which categorises 480 different industries.

Basic EMSI industry data tracks total jobs, average earnings per job, and number of local units by industry. In addition, EMSI builds regional economic models (input/output type) that track inter-industry purchasing relationships. Such models allow researchers to simulate regional “economic impacts” of job gains or losses in specific industries.

Understanding Occupations

Occupations are workforce categories, defining the types of jobs that workers hold. Occupations thus portray industries’ workforce needs, and the FE college that comprehends its region’s workforce requirements will be able to better engage employers and focus its educational mission.

Occupations in statistics are defined by similar sets of tasks and duties that employees are paid to perform. The ONS classifies occupations in the UK according to the Standard Occupational Classification (SOC) code, which was last updated in 2000. SOC codes classify occupations by the kind of work performed (the job) and the performance of tasks and duties (the skill) required to perform the job. As with SIC codes, SOC categorizes occupations in a hierarchical structure of group types—Major, Sub-major, Minor, and Unit—with a corresponding digit level (1-4) whose higher numbers indicate greater detail.

EMSI Occupation data features 4-digit detail for 353 different occupations. It also includes regional industry/occupation tables (called “staffing patterns”) which show the occupational mix of each regional industry.

Demographics

Demographics data gives FE colleges crucial information about their community’s population, which they can use to better understand how to market their services. Demographics is the statistical study of the population which encompasses any number of different characteristics. Key

demographic statistics include gender, age, and race/ethnicity. As with most statistical classification schemes, some terms are harder to define than others. In UK data, Race/Ethnicity is a loosely defined term which, according to the ONS, may refer to nationality, language spoken at home, skin colour, parents' country of birth, religion, and other characteristics. EMSI data reports estimates on these characteristics based on Mid-year Estimates and Projections supplemented with Census data.

EMSI Demographics data features geographic detail to the LAU 1 area level for within 11 NUTS 1 regions (England, Scotland, and Wales).

EMSI Data Sources

EMSI's Economic Forecaster (EF) offers Industry, Occupation, and Demographics data in three different reporting tools, along with a fourth tool that offers an economic overview incorporating all three perspectives. The data in the EF is derived from these and other sources:

- Annual Business Inquiry (ABI)
- The Annual Survey of Hours and Earnings (ASHE)
- The Institute for Economic Research *Working Futures* Report
- The UK Service Sector Report
- The 2001 Census
- The Annual Population Survey (APS)
- The Employee Job Series
- The Quarterly Labor Force Survey (QLFS) National Occupations Report

EMSI Data Process Overview

To create its industry data set, EMSI supplements ABI with several reports that replace its suppressions with intelligent estimates. This data nets us employment numbers for local units at the SIC 4-digit level. Next, we create dampened linear projections for local and national employment using this enhanced data, and control our projections to national employment projections using IER's *Working Futures* report, giving us base-year and projected employment. To finish off our industry data, we combine and harmonize ASHE's earnings-per-worker data (EPW) with ABI's cost-per-worker data (CPW), providing us with industry earnings per worker.

Our process for creating occupation estimates begins with the *Working Futures* report, which is expanded with Census and other data to create a national staffing pattern. Using the QLFS to add regional detail, we adjust the national staffing pattern to the regional totals. With the regionalised staffing pattern in hand, we derive regional occupation job and earnings estimates by running our industry data through the staffing pattern. This process results in

occupational earnings, employment, and replacement jobs estimates for all NUTS 3 geographies in England, Scotland, and Wales.

EMSI's demographics data enhances the official Mid-year Estimates and Projections (MEP) with race/ethnicity base-level data from Census 2001. The MEP, although it lacks race/ethnicity information on its own, nevertheless provides up-to-date population statistics that enable us to move the Census 2001 race/ethnicity data forward through time and create intelligent demographic estimates. EMSI publishes demographic data for age, race/ethnicity, and gender.

Summary of EMSI Data Specifications

Key Features

- Sources carefully selected for user's needs
- Over 15 official UK government and private databases and growing
- Based on official, published data from ONS, Census, and other agencies
- Sophisticated data processing algorithms harmonize data sources, create intelligent estimates and projections, and enhance geographic detail
- Easy analysis of custom geographies
- Web-based access through user-friendly analysis suite, Strategic Advantage

Industry Data

- Estimates for NUTS 3 covering England, Scotland, and Wales
- 762 industry categories
- 2003-2014 historic data and projections
- Base employment
- Projected employment
- Median industry earnings per worker (EPW)
- Regional industry/occupation tables (staffing patterns)
- Number of local units by industry
- Regional input/output models

Occupation Data

- Estimates for NUTS 3 areas covering England, Scotland, and Wales
- 353 occupation categories

- 2003-2014 historic data and projections
- Regional industry/occupation tables (staffing patterns)
- Median annual occupational earnings
- Employment
- Replacement jobs

Demographics Data

- Estimates for local administrative unit (LAU1) areas in England, Scotland, and Wales
- 2003-2014 historic data and projections
- Total Population
- Population by race/ethnicity, age, and gender