UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Laboratorio 2 - Data analysis: metodi e strumenti per l'analisi dei dati di imprese ed enti e del mercato del lavoro

2526-3-E1601N081

Learning objectives

The laboratory has a strongly applied focus and aims to enable students to put into practice the methodologies acquired in their core courses, with specific reference to the analysis of labour market data. The main objective is to develop operational and interpretative skills in data analysis, privileging critical reading and substantive interpretation of empirical results over the acquisition of purely formal statistical notions.

- ***Knowledge and understanding***: at the end of the laboratory, students will have knowledge of: the basic principles of applied empirical social research; the main descriptive and bivariate analysis techniques for categorical data; the underlying logic of the main predictive models for qualitative variables; the interpretative foundations of multiple correspondence analysis.
- ***Applied knowledge and understanding***: students will be able to: design a data analysis pathway starting from an empirical research question; construct and interpret frequency tables and contingency tables; apply independence tests and measures of association for categorical variables; build predictive models for qualitative variables using the educational software Tanagra; read and interpret factor maps derived from multiple correspondence analysis.
- ***Making judgements***: students will develop the ability to: critically assess the adequacy of analytical techniques with respect to the research problem; interpret statistical results in relation to the empirical context and the data used; identify limitations, assumptions and implications of the analyses carried out.
- ***Communication skills***: students will be able to: present the results of a data analysis in a clear and structured manner; correctly use tables, charts and indicators to support interpretation; produce short analytical reports using appropriate language consistent with the disciplinary context.
- ***Learning skills***: at the end of the laboratory, students will be able to: autonomously pursue further learning in data analysis techniques; apply the acquired skills to new empirical contexts and datasets; integrate different methodological tools within a coherent analytical framework.

Contents

Course contents:

- basic tools of empirical social research;
- elements of descriptive statistics for qualitative data;
- univariate and bivariate analysis of categorical variables;
- independence tests and measures of association;
- characterization indices and predictive power measures;
- predictive models for qualitative variables;
- multiple correspondence analysis;
- synthesis and interpretation of analytical results.

Detailed program

The laboratory adopts an interactive and participatory teaching approach aimed at replicating the main stages of an empirical social research process. Each session includes a methodological framing component as well as an applied component, devoted to practical exercises based on real data. The laboratory activities focus on the analysis of administrative and statistical datasets, with particular reference to data on the local labour market. Data processing is carried out using the statistical software Tanagra, specifically designed for teaching purposes, which enables a transparent and replicable approach and supports the interpretation of results in the analysis of categorical data and in the construction of descriptive and predictive models.
The laboratory progressively guides students in the design and implementation of a complete data analysis process aimed at supporting the definition and evaluation of local public policy interventions.
The programme includes:

- definition of the object of analysis and research design;
- operationalization of concepts and construction of variables;
- univariate and bivariate descriptive analysis;
- testing for statistical independence and interpretation of results;
- construction and evaluation of predictive models;
- exploration of relationships among multiple categorical variables;
- presentation of results through structured and commented reports.

Particular attention is devoted to the use of “Mandatory Employment Notifications” (COB) as an example of administrative data suitable for analytical and interpretative purposes.

Prerequisites

Participation in the laboratory requires:

- enrolment from the third year of the degree programme onwards;
- successful completion of Mathematics and Statistics examinations;
- attainment of at least 90 ECTS credits;
- inclusion of the laboratory in the study plan.

Teaching methods

The course is mainly based on guided practical laboratory activities, conducted in a computer lab and including:

- individual and group exercises;
- case study analysis;
- direct use of the educational software Tanagra.

The teaching approach emphasises understanding the data analysis process and the substantive meaning of the results produced.

Assessment methods

Learning assessment is based on:

- active participation in laboratory activities;
- completion of individual and group applied tasks;
- analysis and discussion of case studies.

Assessment is aimed at verifying the achievement of the expected learning outcomes, with particular attention to the ability to apply methods, interpret results and communicate findings effectively.

Textbooks and Reading Materials

Teaching materials (educational software Tanagra, datasets, handouts, slides and analytical outputs) are provided by the instructor during the laboratory activities.

Sustainable Development Goals

QUALITY EDUCATION | GENDER EQUALITY | DECENT WORK AND ECONOMIC GROWTH | INDUSTRY, INNOVATION AND INFRASTRUCTURE | REDUCED INEQUALITIES