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Resource Provision of the Methodological Grounding of Students in Informatics, Statistics, and Econometrics on the Basis of ESS Research Methodology

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1. Introduction

ESS – European Research Infrastructure

- ***"ESS for Bulgaria" Project Consortium*** – a partnership constituted with a general goal: ***to provide significant and long-term opportunities for Bulgarian researchers to sustainably join the international community of ESS***!
- **4 waives in the past (2006, 2008, 2010, 2012)**
- ***The resurrection!*** Ministry of Education and Science – Consortium Contract (August 2018) – inclusion of "ESS for Bulgaria" into the ***National Road Map for Research Infrastructures 2017-2023***.
- **Main tasks** – facilitation of research activities and dissemination of research results; technical and methodological support for empirical analyses, policy reports and recommendations; conferences participation.

1. Introduction

ESS – ERIC

ESS as European Research Infrastructure:

- **European Social Survey methodology:** highest standards for sample design and field work!
- **Headquarters:** City University of London
- **Main tasks of:**
  - Preparing the national questionnaire (including translation)
  - Preparing the data collection (including sampling design)
  - Conducting the data collection (including field work data)
  - Data processing and data delivery
- **Last Round (Wave 9):** ***a total of 31 countries (24 EU, 7 Non-EU) conducting ESS in 2018!***
- **Basic policy:** ***open access*** datasets/methodology!

1. Introduction

ESS – ERIC

Thematic areas (fixed/*rotational* modules)

- Media and social trust
- Politics
- Subjective well-being
- Gender, Household
- Socio demographics
- Human values
- *Immigration*
- *Citizen involvement*
- *Health and care*
- *Economic morality*
- *Family work and well-being*
- *Timing of life*
- *Personal well-being*
- *Welfare attitudes*
- *Ageism*
- *Justice*
- *Democracy*
- *Social inequalities in health*
- *Public attitudes to climate change*

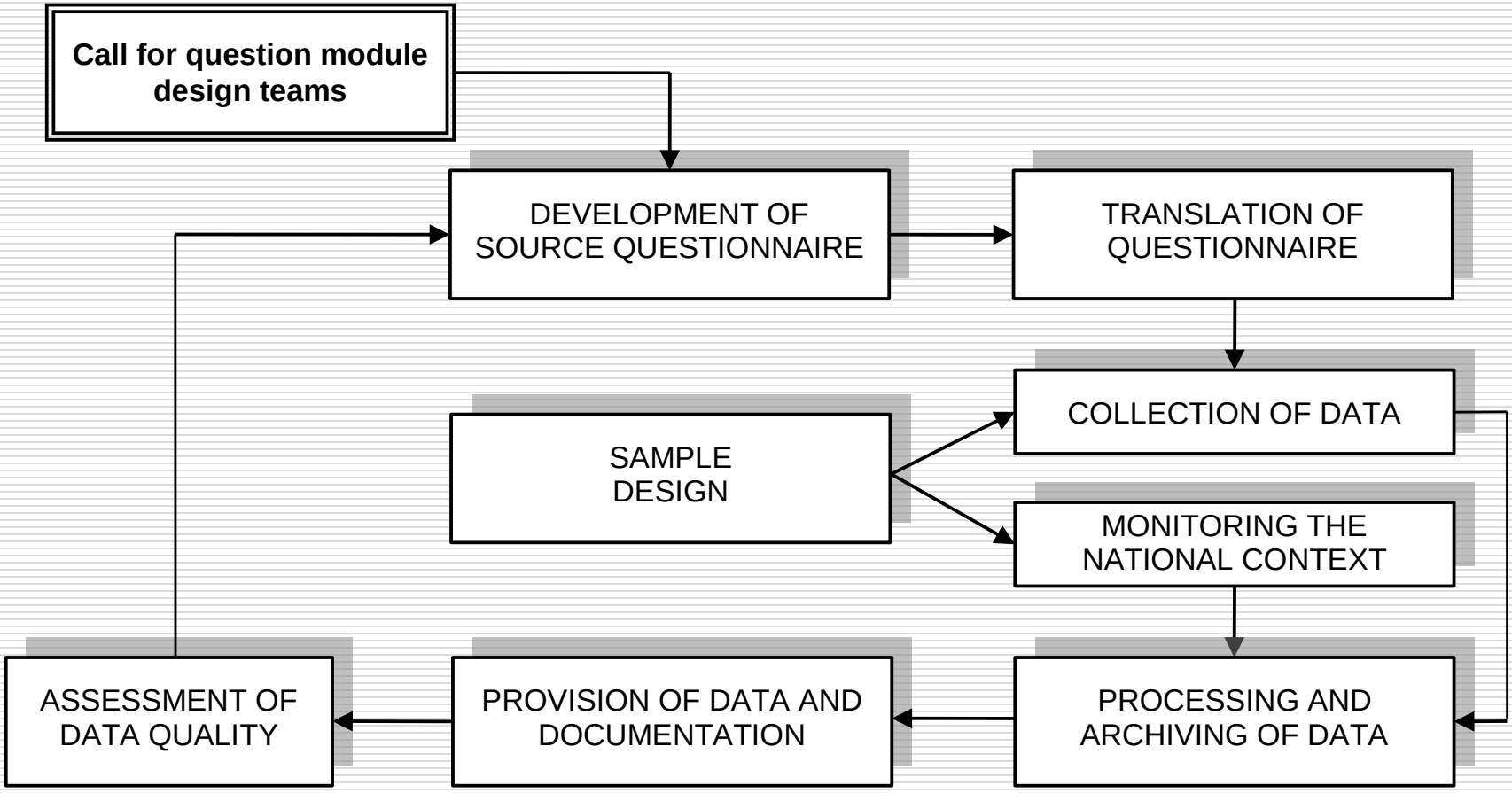
2. ESS in support of teaching empirical research

General methodology – a full cycle of an ESS wave

- **Motivation** – a search of **best practices** that can ***stimulate the interest of the students*** in such fields
- **Main areas of ESS methodology** that proved to be particularly valuable in the major study fields:
  - developing the ***sampling design***;
  - performing ***sample selection procedures***;
  - planning and executing the ***procedures for data collection***;
  - preparing software applications and performing ***primary data processing***;
  - creating ***standardized datasets*** ready for analysis;
  - ***data archiving*** and linking to online extraction software.

2. ESS in support of teaching empirical research

General methodology – a full cycle of an ESS wave



Source: ESS methodology (https://www.europeansocialsurvey.org/methodology/)

3. ESS resources

Sampling, Data collection, Data processing and archiving

ESS methodological resources can substantially facilitate:

- **1) Teaching of sampling methodology**
- ***Sampling designs and procedures*** in ESS are developed under major principles extensively defined in the methodological documents (e.g. ***ESS Survey Specifications***) – detailed procedure for cluster sample planning for nationally representative surveys)
- **2) Teaching of data collection procedures**
- By exploring the ESS specifications, the **student can recognize the *approach for ensuring accuracy of data collection procedures*** (e.g. non-contact rates, contact forms, quality control back checks,…)
- **3) Teaching of data collection procedures**
- The structure and principles of **development, update, and maintenance of the ESS Data Archive** provide indispensable resource for studying ***applied database management and statistical data processing*** (production of harmonized dataflies)!

3. ESS resources
Data analysis

Methods	ESS data	Knowledge and skills for:
Descriptive statistics	Detailed set of personal and household characteristics: Demographic, Social, Economic	Statistical processing and presenting summary data by one, two or more variables (tabular / graphic forms)
Hypothesis testing: non-parametric methods	Numerous variables with nominal or ordinal measurement scales related to: Human values; Politics; Media and social trust; Subjective wellbeing, Health, etc.	Testing for distribution form (normal). Testing with crosstabs (Chi-square). Testing with independent samples (Mann-Whitney, Kruskal-Wallis, Wilcoxon, etc.) or paired samples
Hypothesis testing: parametric methods	Numerous variables with quantitative measurement scales related to: Demography (age, children); Economic activity (income, labour market participation);	Testing about population means Testing with independent samples (t-test; ANOVA) Testing with paired samples Testing about proportions / shares
Classical regression	Simple and Multiple / Linear and Nonlinear regression models. Quantitative dependent variable	Building and estimating regression models (mix of nominal, ordinal,and scale IVs). Interpretation of results
Correlation	Measurement of correlations between any combination of nominal, ordinal, and interval/ratio scale variables	Estimation, hypothesis testing, and interpretation of: classical Pearson product-moment correlation; variance ratio (eta); non-parametric correlations (Spearman,Kendal,etc.)

3. ESS resources
Data analysis

Methods	ESS data	Knowledge and skills for:
Regression with nominal or ordinal dependent variable	Models of binary DV (logit / probit). Multinomial and ordinal logistic regression. Ordinal logit / probit models	Building and estimating regression models. Variety of utilization (mix) of nominal, ordinal, and scale IVs. Interpretation of results
Multivariate analysis: Factor	Principal component analysis. Factor analysis models	Performing a factor analysis procedure. Derivation of latent variables. Interpretation of results
Multivariate analysis: Discriminant	Binary (two-group) and K-group discriminant functions	Performing a discriminant analysis procedure. Standardized discriminant function, Z-scores, testing of hypotheses. Classification table
Multivariate analysis: Clustering	Non-hierarchical and hierarchical cluster analysis (e.g. deriving clusters of respondents with specific profiles)	Performing a cluster analysis procedure. Derivation of clusters. Interpretation of results (cluster centres, degree of homogeneity)
Multivariate analysis: Classification trees	Classification and Regression Trees (CHAID, CART). Decision Tree algorithms	Performing a CHAIND or CART procedure. Solving classification predictive modelling problems. Segmentation studies

4. Final remarks

- ***The main proposition*** – using real-world data from social research infrastructures ***can prompt the students*** – ***activating their curiosity and interest*** – to develop knowledge and skills for ***designing surveys, planning and organizing data collection and archiving procedures, and implementing a variety of empirical analyses***!
- ESS resources provide the instructor with ***a rich arsenal of practical tools*** to formulate ***educational goals, assign individual or group course works, and other study components!***

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Thank you for your attention!

Will be happy to meet you again!