

# Outline data analysis Principal survey EU-project 'ISI-TL'

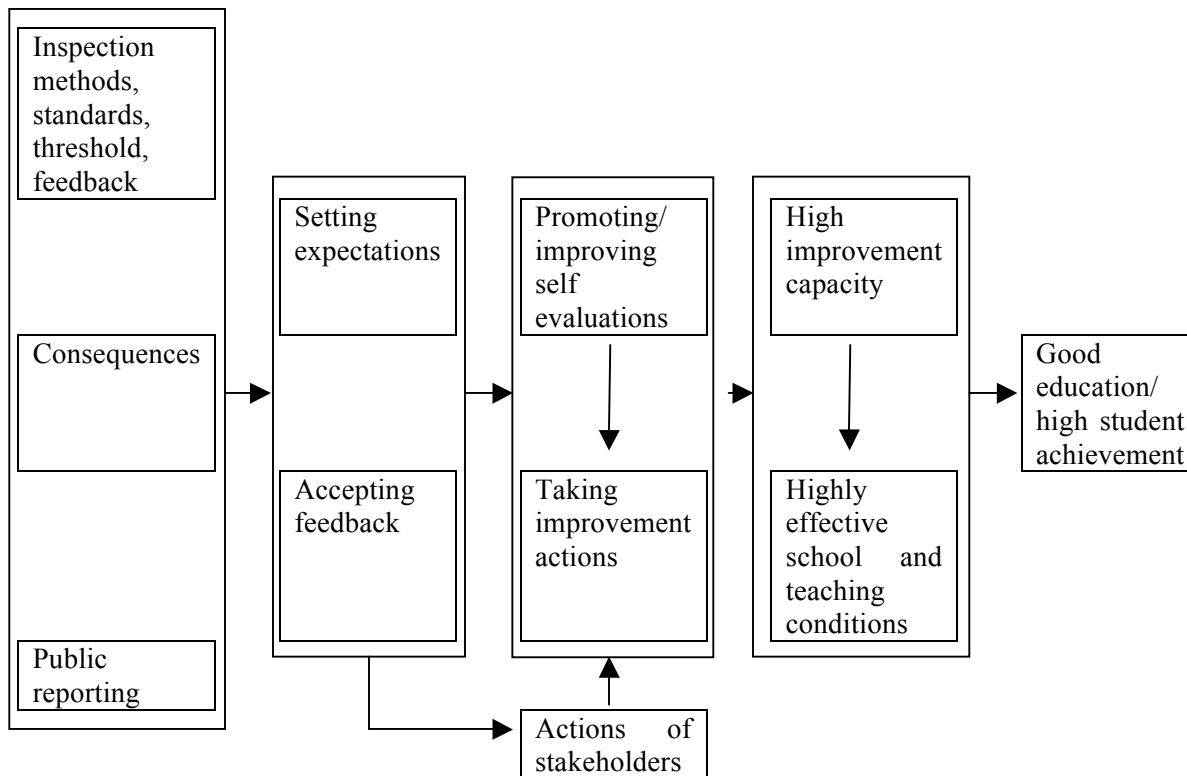
The Czech Republic

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## Introduction

The data analyses described in this document guides the analyses of results of the principal survey within each country. A separate document will describe the cross-country analyses of results. The data analyses intends to explore and test relations as described in our theoretical framework:

*Figure 1. Intended effects of school inspections*



The analyses will be executed and described separately for primary and secondary schools, as inspection models for both types of schools may be different and background characteristics of both types of schools (e.g. size, school organization) are different.

A number of countries (NL, England, Sweden, Norway, Switzerland) have also administered a similar survey to teachers. The analyses described below can be performed separately for the results of the teacher survey; to compare how responses of principals and surveys on the survey may differ. After these separate analyses, the results of both surveys should be combined to perform multilevel analyses. These analyses will be described in section H.

## *Response rates the Czech Republic*

56 primary and 69 secondary schools returned survey data in the Czech Republic, the response rate being 33% for primary and 39% for secondary level. In the Czech case however majority of kids attend schools that combine primary and lower secondary education (age 6 – 15) in one school (institution called basic school). Criteria for evaluation of schools are also similar, so it makes well sense to analyze the data as a one dataset for Czech case (then N=125 schools). However for the comparative purposes due to

differences between primary and secondary education in other countries involved in the survey, we will keep analyses separate for both samples. In the sample schools 38% (21) primary and 32% (22) secondary schools have had an inspection visit in previous school year.

Questions:

- How to deal with missing data (impute)? What type of missing value analysis do we need to do?

A. Descriptive statistics of background characteristics of schools (compared to population when possible)

- Mean and SD for Q1, Q5, Q6

Table 1. Frequencies PRIMARY SCHOOLS

|  | Selection      | Population |
|--|----------------|------------|
| Number of schools:   | 56             |            |
| Percentage of time principals spend on administrative tasks                    | 44%            |            |
| Percentage of time principals spend on teaching                                | 14%            |            |
| Percentage of time principals spend on discussing education with teachers      | 12%            |            |
| Percentage of time principals spend on observing lessons                       | 6%             |            |
| Percentage of time principals spend on managing student behavior               | 9%             |            |
| Percentage of time principals spend on quality assurance/self-evaluation       | 9%             |            |
| Percentage of time principals spend on other tasks                             | 12%            |            |
| Percentage of schools in area with <3000 inhabitants:                          | 21,4%          |            |
| Percentage of schools in area with 3000-15.000 inhabitants:                    | 21,4%          |            |
| Percentage of schools in area with 15.001-50.000 inhabitants:                  | 23,2%          |            |
| Percentage of schools in area with 50.001-100.000 inhabitants:                 | 19,6%          |            |
| Percentage of schools in area with 100.001-500.000 inhabitants:                | 5,4%           |            |
| Percentage of schools in area with >500.000 inhabitants:                       | 9,0%           |            |
| Percentage of schools in each of four different areas:                         |                |            |
| Urban  | 66%            |            |
| Suburban   | 11%            |            |
| Suburban in a metropolitan area  | 2%             |            |
| Rural  | 21%            |            |
| Average number of students in the schools                                      | 424 (SD 192)   |            |
| Average number of teachers in the schools                                      | 28 FTE (SD 12) |            |
| Percentage of schools with majority of students (>50%) from low income groups  | 11%            |            |
| Percentage of schools with majority of students (>50%) from high income groups | 11%            |            |

Table 1. Frequencies SECONDARY SCHOOLS

|  | Selection      | Population |
|--|----------------|------------|
| Number of schools:   | 69             |            |
| Percentage of time principals spend on administrative tasks                    | 43%            |            |
| Percentage of time principals spend on teaching                                | 14%            |            |
| Percentage of time principals spend on discussing education with teachers      | 12%            |            |
| Percentage of time principals spend on observing lessons                       | 6%             |            |
| Percentage of time principals spend on managing student behavior               | 9%             |            |
| Percentage of time principals spend on quality assurance/self-evaluation       | 10%            |            |
| Percentage of time principals spend on other tasks                             | 12%            |            |
| Percentage of schools in area with <3000 inhabitants:                          | 19%            |            |
| Percentage of schools in area with 3000-15.000 inhabitants:                    | 35%            |            |
| Percentage of schools in area with 15.001-50.000 inhabitants:                  | 19%            |            |
| Percentage of schools in area with 50.001-100.000 inhabitants:                 | 11%            |            |
| Percentage of schools in area with 100.001-500.000 inhabitants:                | 9%             |            |
| Percentage of schools in area with >500.000 inhabitants:                       | 7%             |            |
| Percentage of schools in each of four different areas:                         |                |            |
| Urban  | 67%            |            |
| Suburban   | 10%            |            |
| Suburban in a metropolitan area  | 1%             |            |
| Rural  | 22%            |            |
| Average number of students in the schools                                      | 415 (SD 172)   |            |
| Average number of teachers in the schools                                      | 28 FTE (SD 10) |            |
| Percentage of schools with majority of students (>50%) from low income groups  | 9%             |            |
| Percentage of schools with majority of students (>50%) from high income groups | 19%            |            |

B. Descriptive statistics (mean, SD) of scales and subscales:

- Scale 'capacity-building': items Q8-Q13: Mean = 4,51, SD = 0,33
- Scale 'school effectiveness': items Q18-Q22: Mean = 4,10, SD = 0,35
- Scale 'Improvement actions': items Q14 (a-d), Q15 (a-f), Q16 (a-f), Q23 (a-f), Q24 (a-e), Q25 (a-e), Q26 (a-d), Q55: Mean = 3,33, SD = 0,18
  
- Subscale 'Changes in capacity-building': items Q14 (a-d), Q15 (a-f), Q16 (a-f):
  - Mean = 3,57, SD = 0,37
- Subscale 'Changes in participation in decision-making': items Q14a-Q14d
  - Mean = 3,59, SD = 0,53
- Subscale 'Changes in Cooperation between teachers': items Q15a-Q15f
  - Mean = 3,38, SD = 0,42
- Subscale 'Changes in Transformational leadership': items Q16a-Q16f
  - Mean = 3,75, SD = 0,44
- Subscale 'changes in school effectiveness': items Q23 (a-f), Q24 (a-e), Q25 (a-e), Q26 (a-d)
  - Mean = 3,30, SD = 0,20
- Subscale 'Changes in opportunity to learn and learning time': items Q23a-f, Q24a-e
  - Mean = 3,20, SD = 0,22
- Subscale 'Changes in achievement orientation': items Q25a-e, Q26a-d
  - Mean = 3,41, SD = 0,38
- Subscale 'Changes in clear and structured teaching': items Q27a-e
  - Mean = 3,63, SD = 0,50
- Subscale 'Changes in safe and stimulating learning climate': items Q28, Q29, Q30
  - Mean = 3,64, SD = 0,63
  
- Scale 'Promoting/improving self-evaluations': items Q17a-Q17c: Mean = 3,44, SD = 0,77
- Scale 'Setting expectations': items Q38, Q39, Q41a-f, Q43, Q44, Q45, Q48, Q51, Q52, Q53,
  - Mean = 3,37, SD = 0,63
- Scale 'Accepting feedback': items Q34, Q35, Q36, Q37, Q40, Q54, Q60, Q62, Q63, Q64, Q65
  - Mean = 3,41, SD = 0,70
- Scale 'Actions of stakeholders': items Q66, Q67, Q68, q69a-g, Q70, Q71, Q72, Q73
  - Mean = 2,55, SD = 0,54
- Scale 'Unintended responses': items Q46, Q47, Q49, Q50
  - Mean = 1,95, SD = 0,68
- Scale 'General satisfaction with inspection': Q56, Q57, Q58, Q59, Q61
  - Mean = 3,38, SD = 1,01

### C. Reliability

Reliability analysis for all scales and subscales as described in B (showing descriptives for scale if item deleted)

#### PRIMARY EDUCATION

| Scale (non-bold = subscale)  | Cronbach's Alpha | No. of items | Alpha if item deleted (item) |
|--|------------------|--------------|------------------------------|
| Capacity building Q8-Q13   | 0.668            | 6            | 0.735 (Q8)                   |
| School effectiveness Q18-Q22   | 0.573            | 5            | 0.636 (Q20)                  |
| Improvement actions Q14 (a-d), Q15 (a-f), Q16 (a-f), Q23 (a-f), Q24 (a-e), Q25 (a-e), Q26 (a-d), Q55 | 0.906            | 36           | 0.911 (Q24a, Q23e)           |
| Changes in capacity-building Q14 (a-d), Q15 (a-f), Q16 (a-f)   | 0.886            | 16           | 0.887 (Q15f)                 |
| Changes in participation in decision-making Q14a-Q14d  | 0.617            | 4            | 0.628 (Q14c)                 |
| Changes cooperation between teachers Q15a-Q15f   | 0.809            | 6            | no improvement               |
| Changes in transformational leadership Q16a-Q16f   | 0.828            | 6            | 0.839 (Q16a)                 |
| Changes in school effectiveness Q23 (a-f), Q24 (a-e), Q25 (a-e), Q26 (a-d)                           | 0.752            | 20           | 0.775 (Q23e)                 |
| Changes in opportunity to learn and learning time Q23a-f, Q24a-e                                     | 0.296            | 11           | 0.349 (Q24a)                 |
| Changes in achievement orientation Q25a-e, Q26a-d  | 0.797            | 9            | 0.811 (Q25c)                 |
| Changes clear and structured teaching Q27a-e   | 0.815            | 5            | no improvement               |
| Changes in safe and stimulating learning climate Q28, Q29, Q30                                       | 0.775            | 3            | no improvement               |
| Promoting/improving self-evaluations Q17a-Q17c   | 0.871            | 3            | no improvement               |
| Setting expectations Q38, Q39, Q41a-f, Q43, Q44, Q45, Q48, Q51, Q52, Q53,                            | 0.773            | 17           | 0.808 (Q48)                  |
| Accepting feedback Q34, Q35, Q36, Q37, Q40, Q54, Q60, Q62, Q63, Q64, Q65                             | 0.794            | 11           | 0.829 (Q37)                  |
| Actions of stakeholders Q66, Q67, Q68, q69a-g, Q70, Q71, Q72, Q73                                    | 0.833            | 13           | 0.865 (Q73)                  |
| Unintended responses Q46, Q47, Q49, Q50  | 0.678            | 3            | 0.857 (Q46)                  |
| General satisfaction with inspection?: Q56, Q57, Q58, Q59, Q61                                       | 0.753            | 3            | 0.799 (Q61)                  |

SECONDARY EDUCATION

| Scale (non-bold = subscale)  | Cronbach's Alpha | No. of items | Alpha if item deleted (item) |
|--|------------------|--------------|------------------------------|
| Capacity building Q8-Q13   | 0.588            | 6            | 0.594 (Q8)                   |
| School effectiveness Q18-Q22   | 0.432            | 5            | 0.487 (Q20)                  |
| Improvement actions Q14 (a-d), Q15 (a-f), Q16 (a-f), Q23 (a-f), Q24 (a-e), Q25 (a-e), Q26 (a-d), Q55 | 0.906            | 36           | 0.911 (Q24a, Q23e)           |
| Changes in capacity-building Q14 (a-d), Q15 (a-f), Q16 (a-f)   | 0.818            | 16           | no improvement               |
| Changes in participation in decision-making Q14a-Q14d  | 0.506            | 4            | 0.523 (Q14d)                 |
| Changes cooperation between teachers Q15a-Q15f   | 0.657            | 6            | 0.660 (Q15d)                 |
| Changes in transformational leadership Q16a-Q16f   | 0.773            | 6            | 0.789 (Q16a)                 |
| Changes in school effectiveness Q23 (a-f), Q24 (a-e), Q25 (a-e), Q26 (a-d)                           | 0.775            | 20           | 0.782 (Q24e)                 |
| Changes in opportunity to learn and learning time Q23a-f, Q24a-e                                     | 0.563            | 11           | 0.568 (Q24d)                 |
| Changes in achievement orientation Q25a-e, Q26a-d  | 0.751            | 9            | 0.754 (Q25c)                 |
| Changes clear and structured teaching Q27a-e   | 0.823            | 5            | 0.827 (Q27a)                 |
| Changes in safe and stimulating learning climate Q28, Q29, Q30                                       | 0.848            | 3            | 0.861 (Q28)                  |
| Promoting/improving self-evaluations Q17a-Q17c   | 0.847            | 3            | 0.891 (Q17c)                 |
| Setting expectations Q38, Q39, Q41a-f, Q43, Q44, Q45, Q48, Q51, Q52, Q53,                            | 0.881            | 17           | 0.888 (Q38)                  |
| Accepting feedback Q34, Q35, Q36, Q37, Q40, Q54, Q60, Q62, Q63, Q64, Q65                             | 0.864            | 11           | 0.889 (reversed scale)       |
| Actions of stakeholders Q66, Q67, Q68, q69a-g, Q70, Q71, Q72, Q73                                    | 0.843            | 13           | 0.863 (Q73)                  |
| Unintended responses Q46, Q47, Q49, Q50  | 0.438            | 3            | no improvement               |
| General satisfaction with inspection <sup>7</sup> : Q56, Q57, Q58, Q59, Q61                          | 0.909            | 3            | 0.919 (Q61)                  |

#### D. Correlation analysis

- Correlations between all scales and subscales to explore relations between the variables as described in our theoretical model.
- Correlations between background characteristics of schools (Q1-Q7) and scales and subscales to explore if different types of schools perform differently on the scales.

|   | Czech Republic |        |
|---|----------------|--------|
|   | P.S            | S.S.   |
| Satisfaction with school inspections - Setting expectations           | 0.58**         | 0.65** |
| Satisfaction with school inspections - Accepting feedback             | 0.60**         | 0.90** |
| Setting expectations - Promoting self-evaluations                     | 0.47**         | 0.34   |
| Setting expectations - Taking improvement actions                     | 0.43           | 0.15   |
| Accepting feedback -Promoting self-evaluations                        | 0.27           | -0.04  |
| Accepting feedback - Taking improvement actions                       | 0.23           | -0.23  |
| Setting expectations - Actions of stakeholders                        | 0.35           | 0.45*  |
| Accepting feedback - Actions of stakeholders                          | 0.67**         | 0.55** |
| Actions of stakeholders - Promoting self-evaluations                  | 0.15           | 0.06   |
| Actions of stakeholders - Taking improvement actions                  | 0.10           | 0.22   |
| Promoting self-evaluations - High improvement capacity                | 0.34**         | 0.23   |
| Promoting self-evaluations - Effective school and teaching conditions | 0.41**         | 0.21   |
| Taking improvement actions - High improvement capacity                | 0.19           | 0.51*  |
| Taking improvement actions - Effective school and teaching conditions | 0.28           | 0.26   |

Additional correlations (not specifically related to conceptual model)

|   | Czech Republic |       |
|---|----------------|-------|
|   | P.S            | S.S.  |
| Satisfaction with school inspections - Promoting self-evaluations | 0.30           | -0.13 |
| Satisfaction with school inspections - Improvement actions        | 0.10           | -0.39 |
| Satisfaction with school inspections - High improvement capacity  | 0.36           | 0.07  |
| Satisfaction with school inspections - High effective conditions  | 0.23           | 0.26  |

#### E. Regression analysis

- 2 linear regression analyses including as dependent variables scale ‘capacity-building’, scale ‘school effectiveness’; independent variables are scales ‘improvement actions’, ‘promoting/improving self-evaluations’, ‘setting expectations’, ‘accepting feedback’, ‘actions of stakeholders’, and ‘general satisfaction with inspection’. Include ‘being inspected previous year’ (Q33) as a dummy variable
- Additional regression analyses in each country (including other dependent and independent variables) are led by the results of the correlation analyses.

#### Effects of inspection and intermediate mechanisms on improvement capacity of schools (regression analysis)

| <i>Independent variable</i>          | Czech Republic   |                  |
|--------------------------------------|------------------|------------------|
|                                      | P.S              | S.S.             |
| Occurrence of inspection visit       | -                | -                |
| Satisfaction with school inspections | 0.16<br>(0.11)   | 0.19<br>(0.17)   |
| Setting expectations                 | 0.17<br>(0.20)   | 0.41*<br>(0.17)  |
| Actions of stakeholders              | 0.05<br>(0.14)   | -0.32*<br>(0.15) |
| Accepting feedback                   | -0.33<br>(0.17)  | -0.18<br>(0.24)  |
| Promoting self-evaluations           | 0.13<br>(0.07)   | -0.23<br>(0.16)  |
| Improvement actions                  | -0.87<br>(0.23)  | 1.63**<br>(0.45) |
| Constant                             | 4.31**<br>(0.72) | -0.90<br>(1,44)  |
| R square                             | 0.25             | 0.57             |
| Sample size                          | 21               | 21               |

Note: dependent variable: capacity-building; B values are reported with standard error in parentheses, \*  $p < .05$ , \*\*  $p < .01$

Note: B values tell the relationship between predictors (independent variable) and dependent variable. If the predictor increases by one unit, the dependent variable increases by B units (depending on the units used to measure the variables). The standard error indicates to what extent these values would vary across different samples and whether B differs significantly from zero.



Effects of inspection and intermediate mechanisms on school effective conditions in schools

| <i>Independent variable</i>          | Czech Republic   |                 |
|--------------------------------------|------------------|-----------------|
|                                      | P.S              | S.S.            |
| Occurrence of inspection visit       | -                | -               |
| Satisfaction with school inspections | -0.46<br>(0.14)  | 0.11<br>(0.23)  |
| Setting expectations                 | 0.14<br>(0.25)   | 0.18<br>(0.22)  |
| Actions of stakeholders              | 0.25<br>(0.18)   | 0.01<br>(0.19)  |
| Promoting self-evaluations           | 0.25*<br>(0.09)  | -0.24<br>(0.21) |
| Accepting feedback                   | -0.15<br>(0.22)  | 0.06<br>(0.31)  |
| Improvement actions                  | -0.20<br>(0.29)  | 0.98<br>(0.59)  |
| Constant                             | 3.67**<br>(0.92) | 0,33<br>(1,88)  |
| R square                             | 0.28             | 0.05            |
| Sample size                          | 21               | 21              |

Note: dependent variable: school effectiveness; B values are reported with standard error in parentheses, \* p < .05, \*\* p < .01

Note: B values tell the relationship between predictors (independent variable) and dependent variable. If the predictor increases by one unit, the dependent variable increases by B units (depending on the units used to measure the variables). The standard error indicates to what extent these values would vary across different samples and whether B differs significantly from zero.

F. T-test for differences between inspected and non-inspected schools

- Compare responses of schools on the scales and subscales (as described in B) that have been inspected and that have not been inspected in the previous year.

Comparing inspected and not inspected schools

|  | Czech Republic |                  |
|--|----------------|------------------|
|  | P.S            | S.S.             |
| Capacity-building                                | 0.25<br>(54)   | -1.92<br>(67)    |
| School effectiveness                             | 1.56<br>(54)   | -0.95<br>(67)    |
| Change in capacity building                      | 0.35<br>(54)   | -0.42<br>(59.85) |
| Change in participation in decision making       | 0.93<br>(54)   | -0.65<br>(67)    |
| Change in cooperation between teachers           | 0.54<br>(54)   | -0.39<br>(67)    |
| Change in transformational leadership            | -0.44<br>(54)  | -0.08<br>(67)    |
| Change in school effectiveness                   | 0.93<br>(54)   | -1.13<br>(63)    |
| Changes in opportunity to learn                  | 0.99<br>(54)   | -1.39<br>(67)    |
| Changes in Achievement orientation               | 0.95<br>(51)   | -0.45<br>(63)    |
| Changes in clear and structured teaching         | 1.13<br>(54)   | 1.13<br>(67)     |
| Changes in safe and stimulating learning climate | -0.11<br>(54)  | 0.90<br>(67)     |
| Promoting self-evaluation                        | -0.10<br>(54)  | -1.64<br>(67)    |

Note: t-value, df between brackets, \*  $p < .05$ , \*\*  $p < .01$ , mean differences reported for significant differences