



Session Parallel Sessions 4, C) Assessment,  
Friday 6th September  
11am-12.30 am Bateman Room

## **Paper: Assessment and Feedback**

**By: Celeste Varum**; Irina Silva and Vera Afreixo

UNIVERSITY OF AVEIRO

# economicando

The study has been conducted under Research project “Economicando” (PTDC/EGE-ECO/100923/2008), financed by FEDER funds through the Programa Operacional Fatores de Competitividade - COMPETE and by national funds through the FCT - Fundação para a Ciência e Tecnologia.

## **1. INTRODUCTION**

## **2. ECONOMIC LITERACY – WHAT IS IT AND WHY IS IT IMPORTANT?**

- The Concept**
- The Importance of Economic Education**

**Economic Literacy and Children**

**Testing the Effectiveness of Economic Programs**

- Factors Affecting Children's Test Score in Economics**

## **3. METHODOLOGY**

- The Survey**
- Data Collection**
- The Sample**

#### **4. ARE CHILDREN ABLE TO LEARN ABOUT ECONOMIC MATTERS?**

##### **- Level of Economic Literacy post-implementation: study 1**

**Variables**

**The Econometric Model**

**Results of Study 1**

##### **- Variation in Economic Knowledge: Study 2**

**Variables**

**The Econometric Model**

**Results of Study 2**

#### **5. CONCLUSION**

# Economic Literacy – What is it?

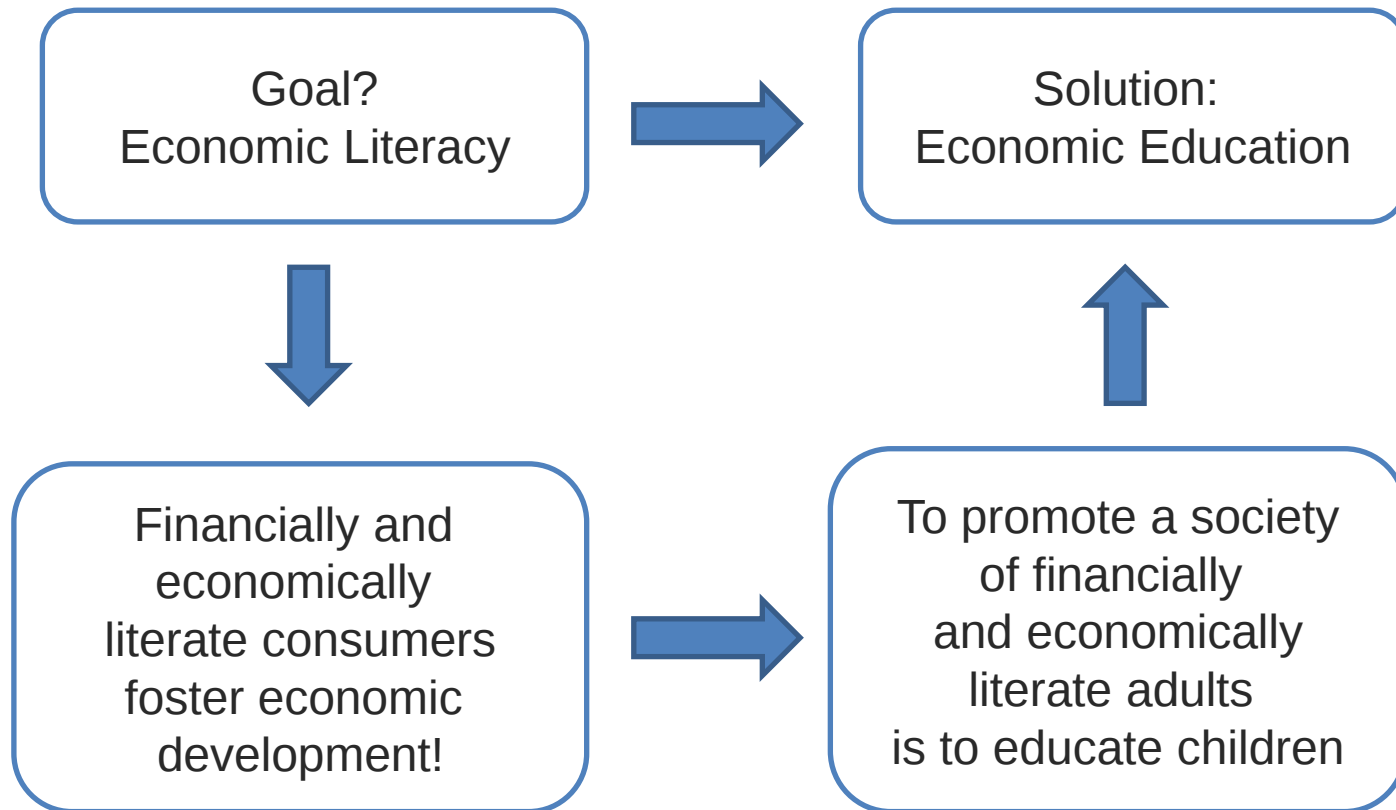
- To have a solid understanding of the functioning of the economic activity [Haskell and Jenkins (2002); Stern (2002)].
- The ability to make clever decisions regarding an efficient allocation of resources, whether they are investors, business people, policymakers, consumers, workers or producers activity [Haskell and Jenkins (2002); Stern (2002)].

Financially and economically literate consumers contribute to stable and prosperous communities, as well to foster economic development [Santomero (2003); Hogarth (2006)]

*The importance of being economically literate*



# Economic Literacy and Children



# Are Children Able to Learn?

Economic instruction is a crucial requisite to achieve economic understanding and reasoning in young children (Kourilsky 1977)

Early instruction in economic principles on the primary grade-level might provide children with a solid understanding of economics, by exposing them to economic conceptions and, moreover, by providing them the skills to apply the knowledge acquired in the economic lessons (Hawthorne, Rodgers et al. 2003).

- Kinder-Economy program (grades k through 2)
  - The Mini Society program (grades 3 through 6)
  - The Co-Learner Parent Education Program
  - The cooperative and mastery learning method (Laney, 1999)
- Kourilsky (1977)



Very efficient instructional interventions in the teaching of economics

# Hypotheses

- *H1: Students who had gone through an economics instruction program are expected to achieve higher scores in economics tests, when compared to those who did not receive formal economics instruction.*
- *H2: Students who had gone through an economics instruction program are expected to have a higher variation of economics knowledge, measured before and after the completion of the economics program, compared to those who did not receive formal economics instruction.*

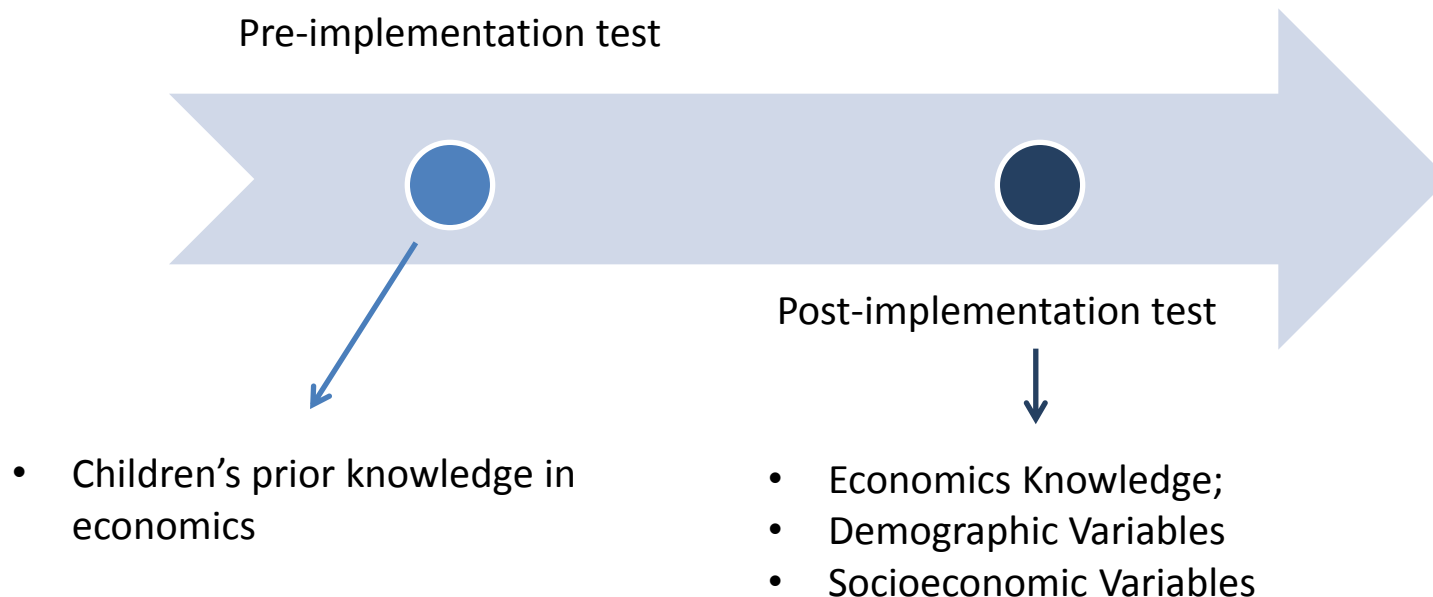
Which other factors are likely to affect children's test scores in economics?

| Factors               | +/-   | Author                                                                                                                            |
|-----------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------|
| Age                   | +     | Walstad and Rebeck (2002)                                                                                                         |
| Gender                | n.s.  | Siegfried (1979) Buckles and Freeman (1983)                                                                                       |
|                       | +     | Heath (1989) Ballard and Johnson (2005)                                                                                           |
| Thinking_vs_feeling   | +/n.s | Ziegert (2000) Opstad and Fallan (2010)                                                                                           |
| Judging_vs_perceiving | +/n.s | Borg and Stranahan (2002) Opstad and Fallan (2010)                                                                                |
| Maths_skills          | +     | Lumsden and Scott (1987) Brasfield, Harrison et al. (1993) Ballard and Johnson (2004) Schuhmann et al. (2005) Clark et al. (2011) |
| Int_economics         | +/-   | Saunders (1980)                                                                                                                   |
| News                  | +     | Webley (2005)                                                                                                                     |
| Reading               | +     | Saunders (1980) Hahn (2006)                                                                                                       |
| Father_educ/ Mother   | +/n.s | Lawson and O'Donnell (1986) Hahn (2006)                                                                                           |
| Income                | +     | Lawson and O'Donnell (1986) Walstad and Soper (1988) Hahn (2006)                                                                  |
| Travelling            | +     | Lawson and O'Donnell (1986)                                                                                                       |
| Bank_account          | +     | Kristof (2009)                                                                                                                    |
| P_saving              | +     | Webley (2005) Kristof (2009) Brock (2011)                                                                                         |
| P_economics / Class   | +     | Webley (2005)                                                                                                                     |
| Class_size            | -     | Raimondo et al. (1990) Becker and Powers (2001)<br>Arias and Walker (2004) Kokkelenberg et al. (2008) Tseng (2010)                |

# Methodology

Similar to other studies, for instance, Ballard and Johnson (2005); Roos, Chiroro et al. (2005) or Brock (2011), it was applied a:

## Questionnaire of Economic Literacy (QEL)



# The Sample

Table 3: Sample Description for the Post-implementation Test

| School | #Students | Sex    |      | Y. Schooling    |                 | Class Size |
|--------|-----------|--------|------|-----------------|-----------------|------------|
|        |           | Female | Male | 3 <sup>rd</sup> | 4 <sup>th</sup> |            |
| 1      | 150       | 68     | 59   | 74              | 76              | 25         |
| 2      | 152       | 65     | 65   | 57              | 95              | 21         |
| 3      | 48        | 21     | 21   | 24              | 24              | 24         |
| 4      | 97        | 44     | 44   | 56              | 41              | 19         |
| 5      | 19        | 9      | 9    | 12              | 7               | 10         |
| Total  | 466       | 207    | 198  | 223             | 243             | ...        |

Out of the 444 students who were submitted to the post-implementation test, only 99 went through the economic program.

# Economic Knowledge Results, 2 nd round

Table 4: Percentage of Correct Answers obtained in the QEL

| Instruction  | Mean     | N   | Std. Deviation | Minimum | Maximum |
|--------------|----------|-----|----------------|---------|---------|
| <b>1</b>     | 0.612067 | 99  | 0.2164337      | 0.1351  | 0.9459  |
| <b>0</b>     | 0.547748 | 345 | 0.1664239      | 0.1081  | 0.8919  |
| <b>Total</b> | 0.562089 | 444 | 0.1805224      | 0.1081  | 0.9459  |

# The Sample

Table 5: Sample Description OF Students Going through the First and Second Study

| School | Number of Students | Sex    |      | Year of Schooling |                 | Class Size |
|--------|--------------------|--------|------|-------------------|-----------------|------------|
|        |                    | Female | Male | 3 <sup>rd</sup>   | 4 <sup>th</sup> |            |
| 1      | 72                 | 38     | 34   | 0                 | 72              | 26         |
| 2      | 91                 | 45     | 46   | 0                 | 91              | 24         |
| 3      | 15                 | 9      | 6    | 0                 | 15              | 24         |
| 4      | 37                 | 21     | 16   | 0                 | 37              | 21         |
| 5      | 18                 | 10     | 8    | 11                | 7               | 9          |
| Total  | 233                | 123    | 110  | 11                | 222             | ...        |

Out of the 233 students who were submitted to both pre and post-implementation test, only 84 went through the economic program.

# Economic Knowledge Results, Variation

Table 6: The Variation of Economic Knowledge

| Instruction | Mean    | N   | Std. Deviation | Min    | Max   |
|-------------|---------|-----|----------------|--------|-------|
| 1           | ,173312 | 84  | ,1799033       | -,4335 | ,7297 |
| 0           | ,094316 | 149 | ,2276981       | -,3607 | ,7568 |
| Total       | ,122795 | 233 | ,2015941       | -,4335 | ,7568 |

# The Model

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + u_i$$

Where  $y$  is the dependent variable;  $\beta_0$  is the intercept term,  $\beta_1, \beta_2, \dots, \beta_k$  are the partial regression coefficients;  $x_1, x_2, \dots, x_k$  the explanatory variables (or regressors),  $u$  is the stochastic disturbance term and  $i$  the  $i$ th observation, more specifically,  $i = 1, 2, \dots, n$ .

- $y_i$  (Study 1)  $\Rightarrow$  A\_QEL, Level of Economic Literacy
- $y_i$  (Study 2)  $\Rightarrow$  F\_eknow, Change of Economic Knowledge

# The Variables

|                              |                                                                                                                                                        |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>INSTRUCTION</b>           | 1 = had formal instruction in economics; 0= otherwise                                                                                                  |
| <b>AGE</b>                   | Student age                                                                                                                                            |
| <b>SEX</b>                   | 1 = male; 0 = female                                                                                                                                   |
| <b>THINKING_VS_FEELING</b>   | 1=thinking personality type; 0=feeling personality type                                                                                                |
| <b>JUDGING_VS_PERCEIVING</b> | 1=judging personality type; 0=perceiving personality                                                                                                   |
| <b>MATHS_GRADE</b>           | 4=excellent; 3=good; 2=satisfactory; 1=unsatisfactory.                                                                                                 |
| <b>INT_ECONOMICS</b>         | 1 = if the student would like to know more about economics; 0 = otherwise                                                                              |
| <b>IMP_ECONOMICS</b>         | 1 = if the student considers that knowing economics is important to his/ her future; 0 = otherwise                                                     |
| <b>NEWS</b>                  | 1 = if the student watches television news; 0=otherwise                                                                                                |
| <b>READING</b>               | 4 = reads books, magazines and journals; 3 = reads only school books and infant-juvenile books; 2 = reads only school books; 1 = does not like to read |
| <b>ENTREPRENEUR</b>          | 1 = wants to create own company; 0 = otherwise                                                                                                         |
| <b>UNIVERSITY</b>            | 1 = wants to go to the university; 0 = otherwise                                                                                                       |

|                        |                                                                                                                                                                                                                                                      |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FATHER_EDUC</b>     | 3 = high qualification; 2 = medium qualification;<br>1 = low qualification                                                                                                                                                                           |
| <b>MOTHER_EDUC</b>     | 3 = high qualification; 2 = medium qualification;<br>1 = low qualification                                                                                                                                                                           |
| <b>INCOME</b>          | 4 = the money is enough to buy EVERYTHING<br>the family wants to;<br>3 = the money is enough to buy ALMOST<br>everything the family wants to;<br>2 = the money only satisfies basic needs;<br>1 = the money is not enough to pay regular<br>expenses |
| <b>TRAVELLING</b>      | 1 = have already travel abroad; 0 = otherwise                                                                                                                                                                                                        |
| <b>BANK ACCOUNT</b>    | 1 = has a bank account; 0 = otherwise                                                                                                                                                                                                                |
| <b>PECONOMICS</b>      | 1 = parents talk about economic issues with<br>their children; 0 = otherwise.                                                                                                                                                                        |
| <b>PSAVING</b>         | 1 = if parents explain the importance of saving<br>to their children; 0 = otherwise                                                                                                                                                                  |
| <b>Class size</b>      | <b># students</b>                                                                                                                                                                                                                                    |
| <b>CLASS_ECONOMICS</b> | 1 = if the teacher discusses economic matters<br>during classes; 0 = otherwise                                                                                                                                                                       |

# Results\_1

| STUDY 1/ VARIABLES    | SIGNAL | SIGNIFICANCE |
|-----------------------|--------|--------------|
| c                     | -      | n.s.         |
| Instruction           | +      | ***          |
| Age                   | +      | ***          |
| Sex                   | +      | n.s.         |
| Thinking_vs_feeling   | +      | *            |
| Judging_vs_perceiving | -      | n.s.         |
| Maths_grade           | +      | ***          |
| Int_economics         | +      | **           |
| Imp_economics         | +      | n.s.         |
| News                  | -      | n.s.         |
| Reading               | +      | n.s.         |
| Entrepreneur          | -      | n.s.         |
| University            | +      | n.s.         |
| Father_educ           | +      | **           |
| Income                | +      | **           |
| Travelling            | -      | n.s.         |
| Bank_account          | -      | n.s.         |
| Psaving               | +      | n.s.         |
| Peconomics            | +      | **           |
| Class_economics       | +      | n.s.         |

\*\*\* significant at 1% level; \*\* significant at 5% level, \*significant at 10% level

# Results\_2

| STUDY 2/ VARIABLES    | SIGNAL | SIGNIFICANCE |
|-----------------------|--------|--------------|
| C                     | -      | n.s.         |
| Instruction           | +      | ***          |
| Age                   | +      | n.s.         |
| Sex                   | -      | n.s.         |
| Thinking_vs_feeling   | +      | n.s.         |
| Judging_vs_perceiving | -      | **           |
| Maths_grade           | -      | n.s.         |
| Int_economics         | +      | n.s.         |
| Imp_economics         | +      | n.s.         |
| News                  | +      | n.s.         |
| Reading               | +      | n.s.         |
| Entrepreneur          | +      | n.s.         |
| University            | +      | n.s.         |
| Father_educ           | +      | **           |
| Income                | +      | *            |
| Travelling            | -      | n.s.         |
| Bank_account          | -      | n.s.         |
| Psaving               | -      | *            |
| Peconomics            | -      | n.s.         |
| Class_economics       | +      | ***          |

\*\*\* significant at 1% level; \*\* significant at 5% level, \*significant at 10% level

# Conclusion

- ✓ *H1*: All else equal, an increase in 1 percentage point in economics instruction would contribute nearly 0,07 percentage points in children's level of economic literacy.
- ✓ *H2*: All else equal, an increase in 1 percentage point in economics instruction would contribute nearly 0,18 percentage points in children's change of economics knowledge from the pre-implementation test through the post-implementation test.
- ✓ Demographic and socioeconomic variables, as well students' attitudes towards economics are the factors which explain the disparities of economic knowledge among children.

# Implications and Limitations

- (1) Small group of students;
- (2) Teacher Performance could also have been considered;
- (3) The questionnaire applied in the thesis might be a useful tool for those that, in the future, would like to keep doing research in this specific area.
- (4) It would be interesting to measure, in a near future, the retention of economic knowledge on the same group of students;
- (5) We would also like to apply the same typology of economic programs to Portugal as a whole.



Session Parallel Sessions 4, C) Assessment,  
Friday 6th September  
11am-12.30 am Bateman Room

## **Paper: Assessment and Feedback**

**By: Celeste Varum**; Irina Silva and Vera Afreixo

UNIVERSITY OF AVEIRO