

Argos observation system. Computer program enhancing observation of classroom processes in primary school



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Introduction

Longitudinal School Effectiveness Study

- Conducted by **Educational Research Institute**
- **Aim:** identification of the key school factors determining the academic achievement of students in Poland
- **Multiple measurements** of individual, family and school characteristics

Why perform observation?

- The need for **reliable data** on teachers' practices and classroom environment

Why create Argos?

- the **lack of observational tools** on Polish market that do not require the presence of a camera during observation

Argos as a computer application

- developed for **Windows** operating system
- based on **.Net framework 4.0**
- written in **C#**
- **GUI** consists of Main Window and the multiple Tool Windows
- the Tool Windows can be **embedded** within the Main Window
- mostly **drag & drop** operations
- **multiple shortcuts** facilitate observer's job
- console interface for **fine-control** and testing of the program
- defines observation with **.xml files** called templates or projects
- projects have modular structure = **easy adaptation and creation**

The Argos observation system

- classroom observation defined with **three templates:**
teacher-focused
student-focused and
didactic (instructional)
- the data from the observation are saved as an **.xml file**

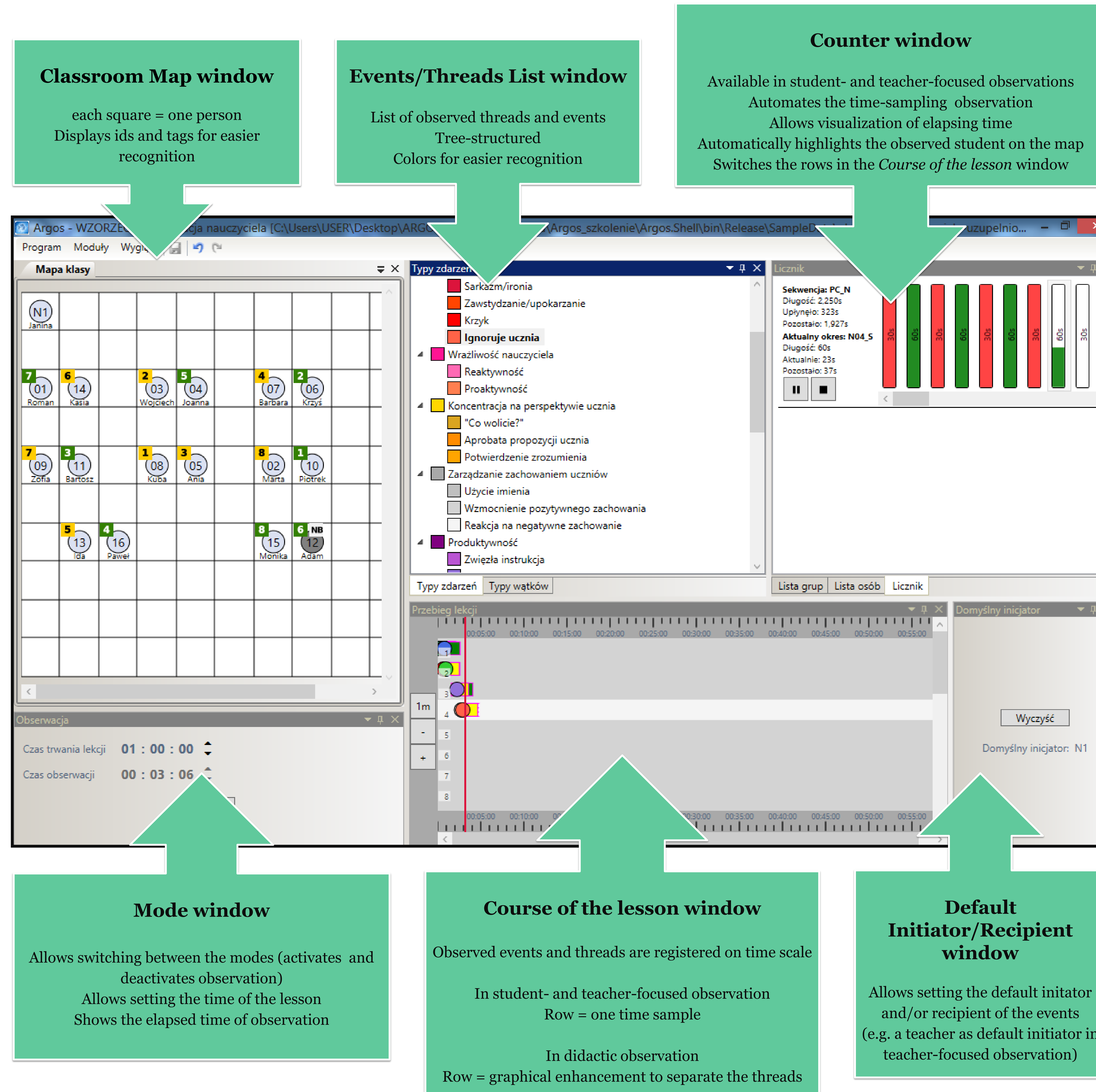
The observation study

20 fifth grade (III-IV 2013)

- pilot study
- goal: the examination of the psychometric properties
- 10 hours of observation (5 hours during Polish lessons, 5 hours during Math lessons) in each classroom (20)
- 37 observers

69 fifth grade (IV-VI 2013)

- main study
- goal: describe class climate in a selected sub-sample participating in the Longitudinal School Effectiveness study (69)
- 15 hours of observation (8 hours during Polish lessons and 7 hours during Math lessons)
- 43 observers



Reliability analysis

Two designs employed during the pilot study:

1. All observers simultaneously code the same video material (3 stages)
 Allows:
 - comparison of observers' performance
 - refining the events/threads lists
 - refining the procedures
2. Real-life double-coded observations (i.e. pair of the observers coded the same lesson in the same template)
 Allows:
 - comparison of inter-observer agreement (within the pair)
 - refining the procedures

Data analysis

- signal detection theory (SDT) basis
- computation of sensitivity and specificity for each observer
- comparing observers on ROC space

Thesaurus

Event - a single teacher or student behavior, observed and marked in the rows of the *Course of the lesson* window (e.g. Teacher reacts on a student negative behavior, Teacher reinforces a student positive behavior, Student works on a task); application automatically remembers time for every event

Thread - longer states (e.g. lesson stages), observed and marked in the rows of the *Course of the lesson* window; application automatically remembers the start time and the end time of the thread

Time sample - a single time-sample lasts 1.5 minutes and contains 30 second, when the observer is observing a student or teacher behavior and the subsequent 60 second, when the observer registers threads or events in the *Course of the lesson* window

Mode - application works in the two modes: a configuration mode (in which the observer prepares working environment) and an observation mode (in which the observer conducts an observation)

Figure 1 Graphical user interface consisting of Classroom map and multiple Tool Windows in teacher-focused observation project