KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Tablit and ETOS

IMPROVING CHILDREN'S UNDERSTANDING OF SCIENCE AND THE SCIENTIFIC DISCOURSE

prof. dr hab. KATARZYNA DZIUBALSKA-KOŁACZYK
dr ANNA BASIŃSKA
mgr DAWID PIETRALA
mgr URSZULA ZIELIŃSKA

INSPIRATION

- Dr Ronald Cole
- Center for Speech and Language Processing
- Language as a tool in the 21st century
- New technologies
- Interests vs market needs

TEAM

- Interdisciplinary team:
  - Center for Speech and Language Processing
  - Faculty of English
  - Faculty of Educational Studies
  - Faculty of Physics
  - Faculty of Chemistry
  - Faculty of Biology
  - Institute of Psychology
  - Support from AMU authorities and administration
- Boulder Language Technologies, USA

KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

ETOS

(E-Teacher Of Science)

An innovative program of supporting science teaching

ETOS supports education at two levels:

primary school (age: 10-12)

junior secondary school (age: 12-15)

E-TEACHER OF SCIENCE

- Duration: 01.09.2010-30.09.2013
- Main goal:

Make primary and junior high school students more interested in physics, chemistry, biology, science and, as a result, encourage them to study subjects which are crucial for the knowledge-based economy

GOALS TO REACH

- Convince teachers to employ more effective methods in the teaching process
- Present teaching/learning as an interdisciplinary and multimodal process
- Move away from learning plain definitions
- Develop students' analytic thinking
- Master the skills which are crucial in the 21st century

ETOS COMPONENTS

- 180 scripts for teachers: science, physics, chemistry and biology
- 180 sets of CASUM Flash animations
- 180 sets of TUTORIAL Flash animations
- 100 simplified science papers in the miniWWW module
- An e-learning platform with the virtual teacher Monika

JUSTIFICATION FOR OUR STRATEGY

- Constructivism – “it is impossible to just describe and explain the world to another person and make him/her personally understand it and know how to act in it” (Klus-Stańska, Kruk, 2009, p.465)

- Young learners, for whom “we limit the opportunity to investigate, ask questions and search answers, and instead provide them with explanations in the form of <school talk>, change their minds and equip them mainly with strategies for listening and memorizing someone else’s knowledge without the ability to construct their own”(Klus-Stańska, Kruk, 2009, p. 467)

- Teaching and making students interested in the topic provides best results when students themselves are able to find answers to the questions formulated by the teacher (King i in., 1998; Palincsar, Brown, 1984; Chi i in., 2001)

WHAT MAKES ETOS INNOVATIVE?

- Questioning the Author, a discourse method that has not been used in Poland before
- Conversations About Science Using Media (CASUM)
  - Flash animations that present scientific phenomena. The animations are used by teachers to engage students in conversations in which they construct scientific explantations
- TUTORIALs in which students interact with the virtual tutor Monika
- The language module in which students learn English vocabulary
- miniWWW

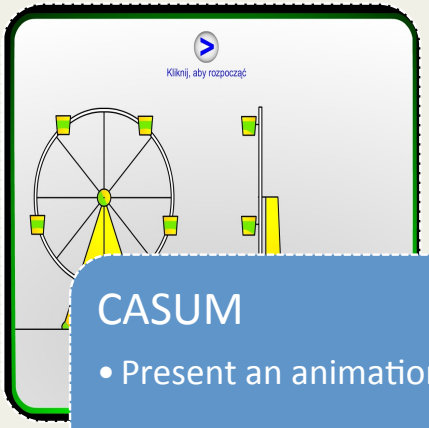
QUESTIONING THE AUTHOR (QTA) - METHOD OF DIALOG MODELING IN THE CLASSROOM

- Isabel Beck and Margaret McKeown (2006)
- In Poland: dr Anna Basińska, mgr Teresa Pietrala, mgr Urszula Zielińska
- Open-ended questions + active listening (phrases expressing interest, paraphrasing students' statements)
- Teacher can use 6 techniques to encourage students to share their experiences and structure the discussion (marking, turning back, revoicing, recapping, modeling and annotating)
- The result – exchange of ideas and opinions which results in proper scientific explanations

Traditional classroom discussion	QTA discussion
questions verify what students remember and check their knowledge	questions verify the level of understanding the phenomena, help students discover meaning, develop analytic thinking
short answers (immediately evaluated by teacher)	longer, developed expressions
the discussion focuses on the interaction between the teacher and a single student, it does not build a comprehensive analysis of the problem	the discussion focuses on the interaction between students, responses of individual students are part of an ongoing discussion
formulated in the „teacher's language"	formulated in the „students' language"
incorrect student responses are immediately corrected by the teacher	incorrect student responses are valuable, they constitute the platform for the discussion
limited students' involvement	extensive students' involvement
product oriented	process oriented

ETOS SEQUENCE

- Time: 45 minutes



CASUM

- Present an animation
- Use QtA

TUTORIAL

- Phenomenon
- Explanation
- Revision
- Test yourself
- Wordmatching

SUMMARY

- miniWWW
- Hands-on activities
- Assessment of children's knowledge

PROGRAM TESTING

- School year 2011/2012
- 11 schools (6 primary and 5 junior high schools)
- 30 classes for grades 4,5,6 at primary level and 1,2,3 at junior high school level
- 25 teachers
- 413 students/ pupils
- Recruitment criteria

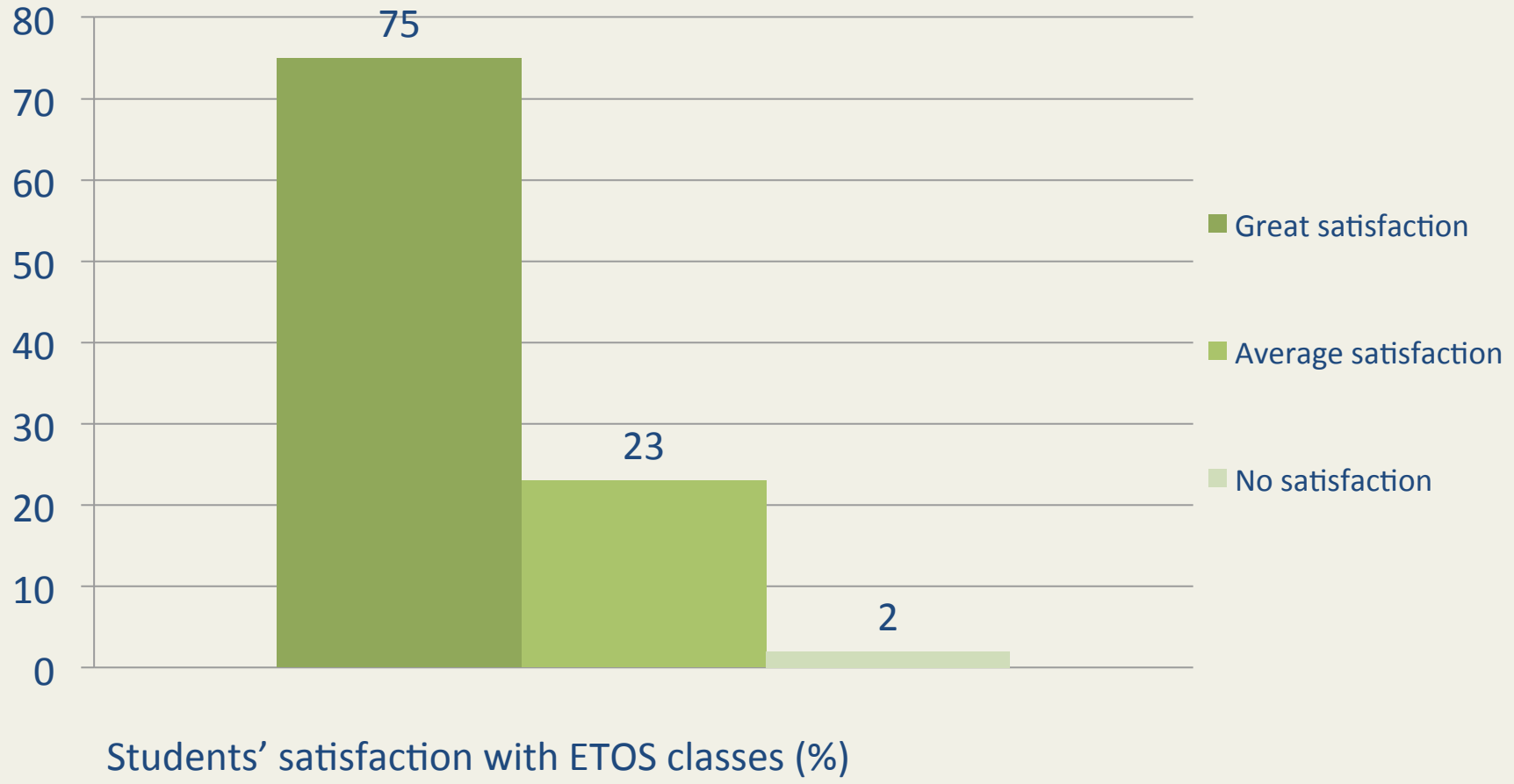
RESULTS

Experimental and control group results – mean rank

Variable	Mean rank			
	ETOS group		Non-ETOS group	
	Quiz I	Quiz II	Quiz I	Quiz II
Level of scientific knowledge	**392,26**	**434,74****	**474,75*****	**352,25**
Level of causal thinking	**371,01**	**455,99*****	**434,49***	**392,51**
Level of heuristic thinking	**337,59**	**489,41*****	406,48	420,52

Results of a statistical analysis by means of a Mann-Whitney U test for two independent samples in the ETOS group (experimental group) and non-ETOS group (control group)
*p<0,05, **p<0,01, ***p<0,001 (symbol placed next to the higher rank)

EVALUATION
STUDENTS' SATISFACTION



Students' satisfaction with ETOS classes (%)

EVALUATION
TEACHERS' VIEWS

Integrating science teaching with teaching English is a good idea

Percentage of teachers who believe that combining science and language teaching is an excellent idea (%)

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

T@BLiT
INNOWACYJNA EDUKACJA PRZEDSZKOLNA

Tablit

An innovative kindergarten curriculum

INSPIRATION

- ETOS program (including QTA method)
- Infantilization of early childhood education
- Children's fascination with nature and science
- New technologies

TABLIT

- Project duration: 02.11.2012-31.07.2015

- The main objective of the project:

Develop Tablit – a kindergarten curriculum which employs the concept of constructivist theory of knowledge and L.S. Vygotsky's theory of development

PROGRAM FOUNDATIONS

- Learning is an active social process which does not mean mere passive reproduction of the teacher's (who is the most active person in the classroom) actions
- "Even clumsy, yet individually reached explanation carries more educational value than understanding and repeating teacher's explanations" (Klus-Stańska, Kruk, 2009, p. 486)
- The importance of the relationship between the use of tools and signs (including the language) and mental development
- The more complex action the situation requires and the less simple the way to solve it becomes, the more important is the role of speech in the whole process; without it the child is unable to complete the task (Vygotsky, 2002)

OBJECTIVES

- Make children more interested in the world of science
- Increase understanding of some natural phenomena
- Develop independence in learning
- Develop communicative skills
- Expand knowledge of English vocabulary
- Change the teachers' attitude to the educational process
- Develop media literacy while teaching and learning.

STRATEGIES

- The Project Approach
- The QtA method
- Multimedia materials (CASUM and TUTORIALs) – all related to science

THE PROJECT APPROACH

- In-depth study of a particular topic with a significant cognitive value for the child
- “The key feature of a project is that it is an investigation – a piece of research that involves children in seeking answers to questions they have formulated by themselves or in cooperation with their teacher” (Katz, Chard, 2000, p. 2)
- Topics related to the immediate reality allow children to explore what they are interested in; children also have the freedom of action, so they explore their experience, develop creativity and curiosity
- A lot of opportunities to team work creates occasions for task sharing and taking responsibility for the work
- The culminating event scheduled for the end of the project gives the children the ability to present their achievements and reinforces the feeling of success

TABLIT COMPONENTS

The Tablit curriculum

- 27 scripts for 4-week projects
- More than 200 worksheets for children
- 27 songs and poems related to the topics from the curriculum
- 135 CASUM sets
- 54 TUTORIALs
- 27 games in English
- 27 word banks for English and Polish
- An e-learning platform
- Approximate Development Scale

ENGLISH LANGUAGE MODULE

Games

- Six game formats:
  - Memory
  - Puzzle
  - What's missing?
  - Hopscotch
  - Drag and drop
  - Hidden objects
- To be used in the third and fourth week
- Children experiment with /play the game
- Children listen to and repeat words

ENGLISH LANGUAGE MODULE

Word banks

- A set of cards whose arrangement and appearance is similar to the well-known memory game, but with symbols uncovered
- Symbols in both word banks are identical in a project, and differ only in the words recorded: clicking the card starts the recording
- Children click cards and listen to the words during their free time
- Teachers are advised to use word banks with children as early as at the end of the first week and repeat the activity regularly during the remaining weeks of the project

ENGLISH LANGUAGE MODULE

Advantages

- Children are exposed to the language
- Activities are attractive and engaging
- A few senses are involved in the process
- Children can choose the time to play games
- They get satisfaction from completing the task – sense of achievement
- Symbols based on animations – the context is well-known

TABLIT SEQUENCE

Week 1

- Introductory activities
- Estimation of knowledge
- End of the week: word banks on the platform

Week 2

- 5 main ideas
- Multimedia materials on the platform
- QtA
- Exploration

Week 3

- 2 TUTORIALs
- Multimedia materials on the platform
- Children's activities suggested in the script
- Preparations for the culminating event
- Language games on the platform

Week 4

- Preparations for the culminating event
- Culminating event (last but one or the final day of the project)
- Children's activities suggested in the script
- Language games

EVALUATION

- Preschool year 2013/2014 and 2014/2015
- 18 kindergarten groups
- Development scale (research purposes and for teachers)
- Teachers' opinions and suggestions
- 4 language tests – at the beginning and at the end of each year

MORE INFO

http://wa.amu.edu.pl/e-nauczyciel

http://wa.amu.edu.pl/tablit

http://tablit.wa.amu.edu.pl

https://www.facebook.com/tablit2013

http://tablit.blog.pl/

KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY

Thank you

PROJEKT WSPÓŁFINANSOWANY ZE ŚRODKÓW UNII EUROPEJSKIEJ W RAMACH EUROPEJSKIEGO FUNDUSZU SPOŁECZNEGO