

University of Ljubljana  
Faculty of Computer and  
Information Science



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**Edoo: Involving  
Teachers in the  
Development of  
E-learning Material**

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# Outline

- Background
- Edo0 initiative
- Involved parties
- Experiment
- Results



# Motivation

- Problems
  - Students
    - With student projects
  - Teachers
    - With suitable e-learning material
- ... and possible solutions
- How it all began



# Students as Developers

- University of Ljubljana, Faculty of Computer and Information Science
- Elective course at Masters Level
  - E-learning
    - Focus on technological aspects of e-learning
- Student project
  - Developing educational games



# Students as Developers

- Students
  - Good knowledge and experience in
    - Programming
    - Software development
    - Engineering
  - Poor didactic competences
  - Lacking pedagogical skills
  - No or unrealistic ideas
    - Real world problems



# Teachers as Users

- Primary schools and High schools
- Different subjects
- Use of e-learning material in class
  - Finding appropriate material
    - No flexibility for adaptation
      - For individual learning scenarios
      - For a particular educational context
    - There is no "one-size-fits-all"
      - No material serves **all** scenarios
  - Changing and customizing existing material



# Teachers as Users

- Teachers
  - Experienced school teachers
    - Rich pedagogical knowledge
  - Little or no experience in ICT
  - With innovative ideas
    - For improving lectures
    - Attractive e-learning materials
  - Lacking knowledge for realisation



# Proposed solution

- Coupling students with experienced school teachers
- Encouraging enhanced collaboration
  - Between producers and users of learning materials
- Connect developers and users
  - In order to increase quality and value
- Voluntary activity





# Edoo Initiative

- Main goal: creating didactic applications
  - Of good quality
  - That suit teachers' needs in class
  - Modular and adaptable
- Increased involvement of teachers
  - In process of developing e-learning materials
- Engaging a group of interested teachers
  - To actively participate in development process
  - Providing ideas and relevant feedback
    - On suitability and utility of developed educational software



# Starting Edoo Initiative

- Started in spring 2013
  - At SIRikt 2013 Conference
  - Idea presented to broader teacher community
  - Invitations to join online community

*Imate dobre ideje,*  
kako bi s pomočjo izobraževalnih  
programov izboljšali vaše učne ure  
in jih naredili bolj zanimive?

*Vam manjka izkušenj*  
in znanja programiranja, da bi  
lahko sami razvili izobraževalne  
programe, ki bi jih uporabili pri  
pouku?

**Edoo!**  
www.edoo.si

Projekt Edoo poskuša povezati skupnost učiteljev in programerjev z namenom ustvarjanja kakovostnih didaktičnih računalniških programov, ki bi jih učitelji lahko uporabljali pri pouku. Glavni namen je predvsem oblikovanje idej za izdelavo didaktičnih pripomočkov za različne šolske predmete.



# Edoo Workshops

- Discussions
  - Current problems
    - Regarding existing e-learning materials
    - Teacher's needs, wishes
  - Ideas for projects
    - Educational games
- Presenting proposed projects by students
- Preparing new ideas for student projects
- Refine all ideas
- Establishing cooperation with students' project groups



Firefox

Edoo | Učni objekti za e-izobraževanje

Univerza v Ljubljani  
Fakulteta za računalništvo  
in informatiko

Programerji

Edoo  
Učni objekti za  
e-izobraževanje

Učitelji

Borza

Učni objekti

O PROJEKTU UČITELJI PROGRAMERJI UČNA GRADIVA OBVESTILA KONTAKT SPLETNA UČILNICA

## O projektu

**Edoo** je projekt, v okviru katerega poskušamo ustvariti in povezati skupnost učiteljev in programerjev. Namen te skupnosti je ustvarjanje kakovostnih didaktičnih računalniških programov (učnih gradiv), ki bi jih učitelji lahko uporabljali pri pouku.

**Programerji** v tej skupnosti so študenti Fakultete za računalništvo in informatiko (FRI), ki v okviru svojih študijskih obveznosti (navadno seminarskih nalog) izdelujejo elektronska učna gradiva. Kot študentje računalništva imajo ustrezno znanje programiranja, manjka pa jim vpogled v realne potrebe v praksi in tudi didaktično znanje za izdelavo atraktivnega didaktičnega scenarija.

**Učitelji** v skupnosti so osnovnošolski in srednješolski (pa brez zadržkov tudi višješolski) učitelji, ki imajo dobre ideje, kako nadgraditi njihove učne ure z elektronskimi učnimi gradivi, a jim primanjkuje programerskega znanja za realizacijo te ideje.

**KONTAKT**

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**ZADNJE OBJAVE**





# Edoo Web Classroom

- Separate course for each project
  - Enrolled
    - Members of students' development team
    - Interested teachers
  - Forum for meetings and discussion
    - Members exchange ideas and comments
    - Purifying ideas
    - Designing new didactic expedients
      - For different school subjects
- Keep track of joint projects



# Edoo Web Classroom

- Developing educational application
  - Uploaded as course content
    - SCORM packages
  - After each iteration in development process
  - Enabling instant use and testing
    - Within Moodle environment
    - Feedback provided through forum discussions
      - Suggesting improvements
      - For next iteration



# Guidelines (1)

- To increase usability and prolong lifespan
  - Of educational applications
- Implement in a modular way
  - Reuse individual parts
  - For changed learning scenarios
- Customization
  - Allow teachers to change and adapt the content
    - E.g., text or images
    - To their specific needs in class





## Guidelines (2)

- Separate the application's framework from its content
  - Allows for content modifications
  - Without affecting the application's structure
- Maintain a source code repository
  - Modify code
  - Add new functionalities
  - Publicly available source code



# Edoo Experiment

- Initiative started in spring 2013
- First collaborative projects
  - Implemented in winter semester of 2013/2014
- Some topics developed by students
  - No teacher's involvement
- Several topics suggested by teachers
  - Workshop at the beginning
    - Fruitful project ideas
  - Limited interaction during semester
    - What went wrong?



# Some examples...

## Computer Graphics - Web Examples

Projection: orthogonal (parallel) and perspective

<- back

**Info:** In the sketch on the right you can see example, how projection is done.

**Camera settings:**

Position[px]:    LookAt[°]:

**Custom aspect** **Auto aspect**

**Left:**  px

**Right:**  px

**Top:**  px

**Bottom:**  px

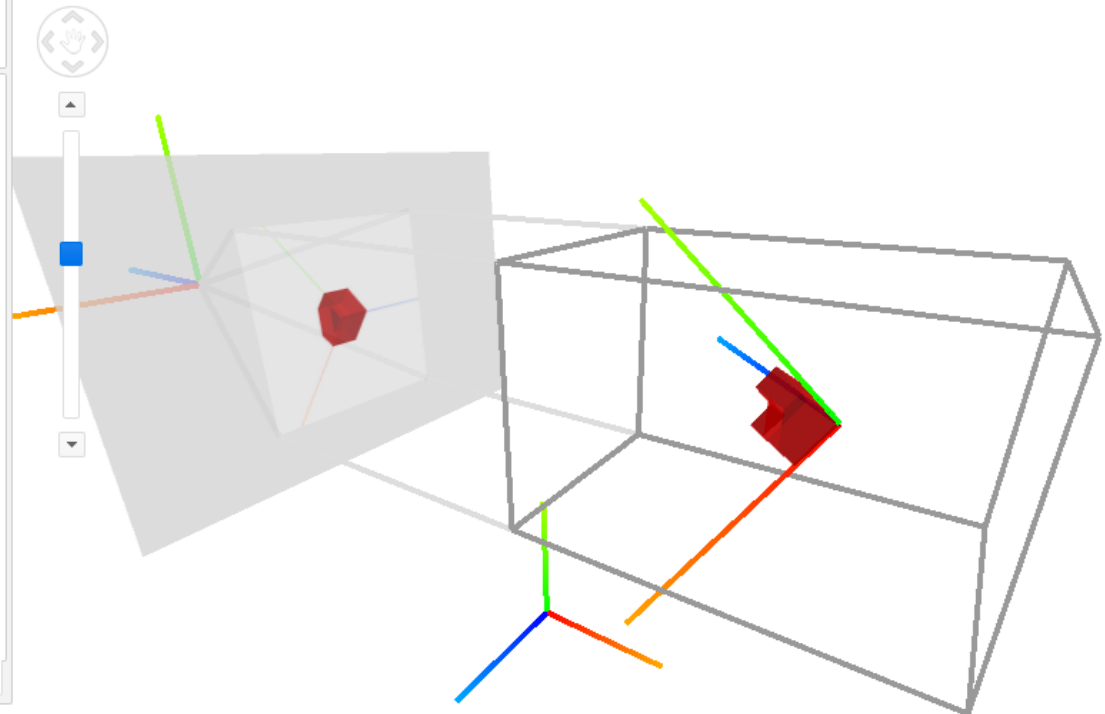
**Near:**  px

**Far:**  px

**Camera projection matrix:**

0.02	0	0	0
0	0.02	0	0
0	0	-0.01	-5
0	0	0	1

**Perspective** **Orthogonal**



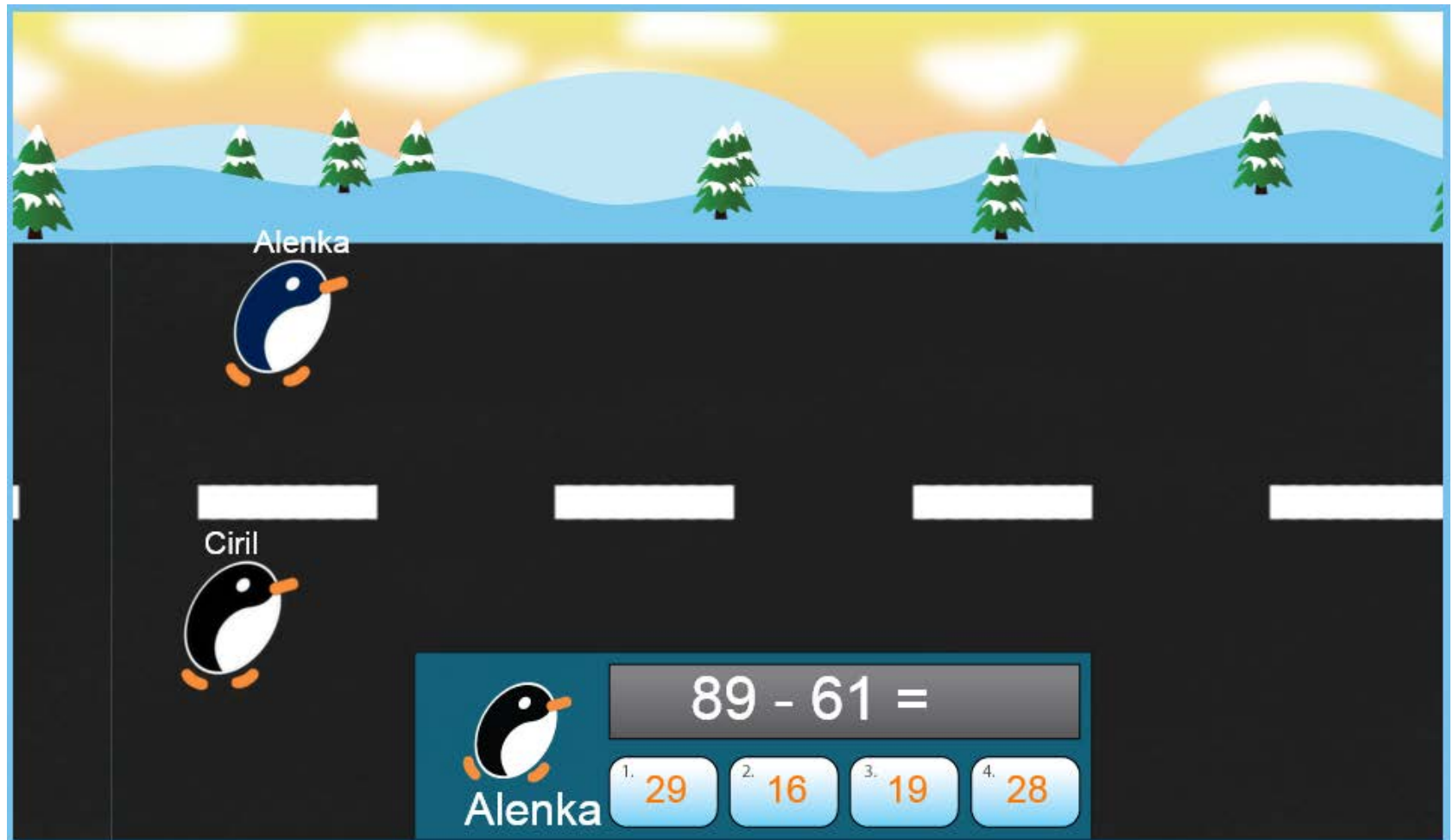


# Some examples...





# Some examples...







# Preliminary results

- We still have to carry out formal evaluation of results
- Promising student progress reports
  - During semester
  - Increased enthusiasm, higher productivity
  - More focused pursuit of objectives
- Preliminary overview of student project results
  - Not as encouraging as expected
  - Possible problems
    - Using wrong tool for communication (?)
    - Voluntary participation (lack of time)
    - ???



# Future Work

- Final results still have to be analysed
- Evaluation of prepared e-learning material (games)
  - Focus on usability, modularity and modifiability
- Next iteration of projects
  - Starting in fall 2014
  - Teachers' feedback will provide the basis
  - Improving
    - Development process
    - Communication



# Future Work

- Source code repository
  - Publicly available
  - Involvement of external participants
    - Enthusiasts, teachers with ICT skills
  - Personalization
- Extend community of developers
  - Beside computer science students
  - Other enthusiast programmers
  - Contributing time and knowledge





# Conclusion

- Initial experiences needed to effectively manage collaboration of teachers with student developers
- Identification of specifics of such teamwork
- Insight into creation process and collaboration of two communities
- Prepare examples of good practices
  - For future development
- A modified model of development methodology needed
  - Takes into account the specifics of student projects and involved volunteer on-site users



# Questions?