Accessibility of the Computer Science study for students with visual impairment

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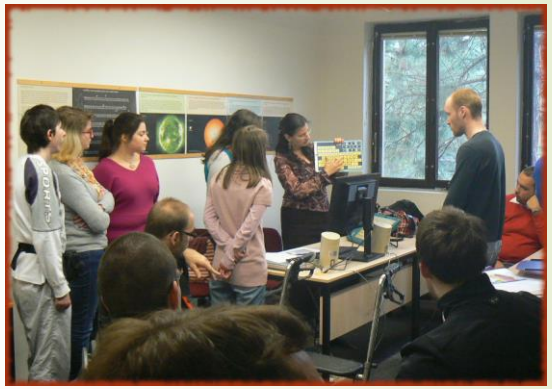
Support Centre for Students with Special Needs

- Service and counselling for students with disabilities
- Preventing of information and physical barriers
- Meetings and workshops for teachers

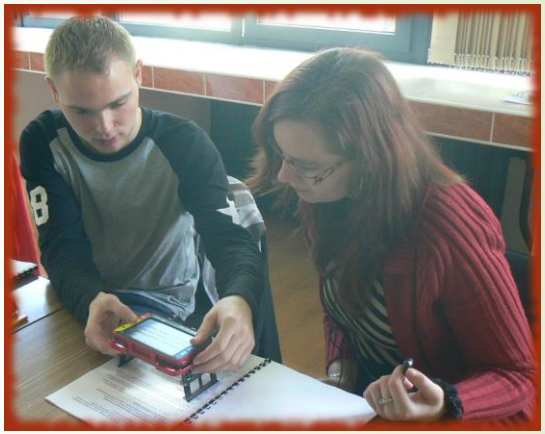


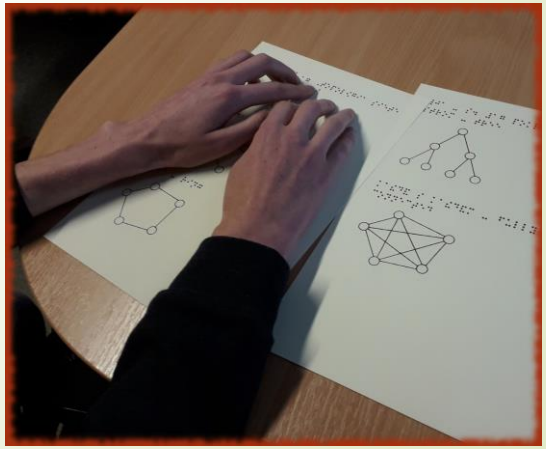
Educational and technical activities

- **Practical training courses**
  - Improving skills to use assistive technologies
- **Lending devices**
  - Braille display
  - Desktop and portable video magnifier
  - Braille embosser
- **Accessible learning material**
  - Electronic or Braille documents
  - Large print
  - Tactile graphic

Cooperation with departments of the University

- Participation in projects aimed at supporting teaching informatics on high schools
- Developing teaching materials in informatics for students with visual impairment



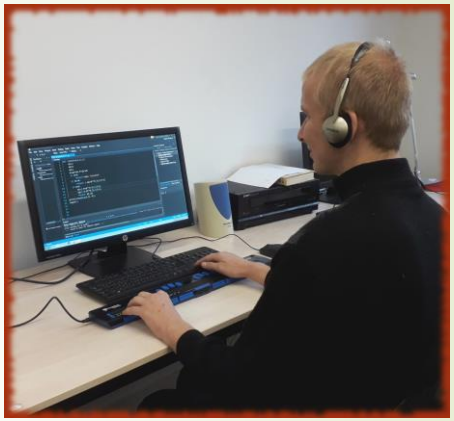


Purpose of the research

- **To understand the special needs of the students with visual impairment**
  - aaccessibility of
    - the teaching materials
    - the programming environment
- **To identify appropriate teaching methods**
  - to strive for more effective learning strategy
- **To observe how visual impairment impacts their study of the computer science**
  - to understand programming concepts
  - to eliminate misconceptions

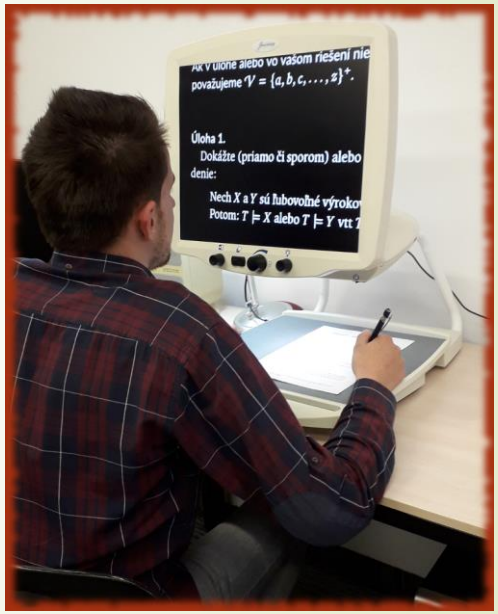
Research questions

- What programming concepts are problematic in terms of visual feedback?
- Does visual impairment cause misconceptions?
  - If so, what?



Research methods

- **Qualitative research strategy**
  - Framework – case study
- **Direct observation**
  - Teaching methods
  - Usage of assistive technology
- **Participant observation**
  - Learning strategy
  - Understanding vs. misconceptions
- **Structured Interviews**
  - Students
  - Teachers



Participants

- **Blind student**
  - can read the Braille and tactile graphics
  - uses computer with screen reader
  - does not have visualization, because impairment occurred from early childhood
- **Student with low vision** 1
  - can read the Braille
  - uses computer with screen reader and magnifier
  - has good visualization, but is not able to use handwriting
- **Student with low vision** 2
  - reads large print
  - uses computer with magnifier
  - has good visualization and uses handwriting

Observation findings

- **Interactive cooperation**
  - Discussing
  - Inaccessible web application – disoriented student
- **Individual work**
  - Accessible web-based solutions testing application
  - Dealing with tasks at own rate
- **Small groups**
  - Fully participation of students with visual impairment
- **Per-set examples**
  - Extra time to solve tasks

Future work

- Cognitive development in learning programming
- Analysis of mistakes in the code
- Misconceptions
- Alternative forms of the visual presentation

Thank you for attention, your questions...

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