



ACTIVE LEARNING IN EDUCATION OF SCIENCE IN HUNGARY

The purpose of education and postgraduate course of teachers

- the motivation of learners activity: development of efficiency for better achievements
- teacher-learner relationship: the role of helping pedagogue
- the teacher recognizes the learner's special needs
- organization of the development of individual and communal competencies
- development of self-supporting and responsibility
- learner collects, selects, analyses and evaluates the information
- the learning of learning, the pleasure of knowledge
- the need and the beauty of lifelong learning

Conditions of high quality education

- the usage of the students' previous experiences and knowledge
- optimal teaching-learning environment (physical and mental situation, freedom and discipline, "learning adventures")
- the quality of learning material (curriculum, resources, technical devices)
- the teacher's personality and new role: competence developing mentor
- results, competencies defined
- examination, checking and measurements of learners' competence

The levels of active learning methods

- basic level (elementary school, 6-14 years)
- middle level (grammar school, vocational school, 14-18 years)
- advanced level (college, university, 18-23 years)

Conditions and types of active learning methods

I. Complex Instructing Program (60 hours accredited postgraduate course of teachers)

- usage of learners' interactive cooperation
- keywords: expectation and competence; each student should be equal, active and responsible
- characteristic: various curriculum, special instructing strategy, interaction in smaller groups

II. The cooperative learning (30 hours accredited postgraduate course of teachers)

Principles:

- constructive interdependence, individual responsibility, equal participation and simultaneous interaction
- the most important methods: group work: round tables, interviews, word definition, practice, test, experiment, study excursion, project work, drama pedagogy, community constructing games, simulation, ICT and case study

Project method (30 hours accredited postgraduate course of teachers)

Features:

- the “student in the focus” – the problem-oriented model
- the main resources of knowledge: experience, experiment, taking apart, assembling, presentation; learning by doing, ICT
- the unity of the world taken apart into pieces: linking knowledge, multidisciplinary
- the whole personality takes part in the cognition, creativity and a reproduction in learning
- the teacher is a supporting partner, moderator, mentor

Project types

- multidisciplinary
- interdisciplinary
- subjects

Work forms

- individual
- ability specific self work
- group

Documents of the project

- project description
- the full text of the tasks
- requirements of documentation
- criteria of the evaluation

Drama: learning through dramatic action (120 hours accredited postgraduate course of teachers)

Game: competition played according to rules

Simulation: cognition by modeling

Case study: presentation of the phenomenon based on an example

Links

<http://www.szakma.hu/>

<http://www.opkm.hu/>

http://pszk.nyme.hu/attachments/198_kooperativ_tanulas.pdf

<http://www.ofi.hu/>

<http://www.atomcsill.elte.hu/program/>

<http://edutech.elte.hu/>

<http://www.sulinet.hu/>

<http://www.educatio.hu/>

<http://www.kando-kkt.sulinet.hu/public/erdekes/naprend/index.htm>

http://celebrate.digitalbrain.com/celebrate/community/celebrate/resources/Hungary/hungary_webpages/Hungarian%20-%20Language.db_psc?verb=view

ACTIVE LEARNING BY MAKING RESEARCHES

Name of the Company: 11. class

Name of the used active learning method

Active learning by making researches

Description of the method

Topic: yeast and mildew, life conditions of microbes

Group work, brainstorming, questions and answers, microscope, observation, conclusion, presentation

Application steps (How do you apply this method in a science course)

- the learners gather the life conditions of microbes: brainstorming
- the learners make groups based on the life conditions of microbes: oxygen, temperature, pH value
- each group writes questions on cards about the life conditions of microbes and also writes the answers on the other side of the card
- the groups ask each other their questions and also answer them
- the teacher helps to highlight the key questions
- experiment, observation: the groups adjust their microscopes and observe, examine the nascent microbes
- the learners write down the necessary life conditions of the examined multiplying microbes
- teacher and self evaluation

ACTIVE LEARNING OUT OF THE CLASSROOM

Name of the Company: grammar school, 12. class (18 students)

Name of the used active learning method

Active learning out of the classroom

Description of the method

Study trip to the nuclear power station of Paks

Group work, note making, photo taking, interview making, summary, PPT making

Application steps (How do you apply this method in a science course)

- visitor center: history of the settlement and local traditions
- attendance to the presentations, individual note making: the theory, evolution and the operating principles of the nuclear power plant
- interview with the presenters
- observation of the background radiation
- experiment: playful energy production with a home bicycle: the amount of energy that is sufficient to work a bit and light

The visit

- the works area: 33 m high;
- protection equipment: helmet, ear-plug
- block commander
- fusion reactor area
- turbine hall

Exercises

- group work: giving the tasks, individual and group work
- written report (author: 3x6 learners)
- taking photos for illustration (3 learners)

- individual note making (18 learners)
- summary, PPT making in 3 groups (author:3x6 learners)
- evaluation, discussion

Link: www.npp.hu

INTERNET RALLY: DEVELOPMENT OF THE ICT COMPETENCE

Name of the Company: grammar school, 12. class

Name of the used active learning method

Internet rally: development of the ICT competence

Individual knowledge gathering, pair work, group work

Description of the method

- motivation for learning
- sense of achievement
- aim of the method: practice of the selective and close reading, controlled information gathering in a topic
- partition of relevant and irrelevant
- develops the individual critical and orienting skills
- teaches with the individual assemblage of the curriculum

Task: presentation (PPT) making

Subject: physics

Topic: Sun

Appliances: computer, internet, projector

Application steps (How do you apply this method in a science course)

- Introduction
- Energy production of the Sun
- The atmosphere of the Sun
- Sunspots
- Sun activities
- Protuberancy
- Sun eruption

- Solar Wind Source
- Lifetime of the Sun
- Links
- Presentation making (PPT)
- Presentation in the lesson
- Comparison of the solutions in pairs and groups
- Evaluation, discussion

ACTIVE LEARNING WITH THE APPLICATION OF CREATIVITY AND CRITICAL THINKING

Name of the Company: grammar school, 12. class (18 students)

Name of the used active learning method

Active learning with the application of creativity and critical thinking

Description of the method

Topic: nuclear power plants

Group work, pair work, discussion, argument, PPT making

Application steps (How do you apply this method in a science course)

- group work: giving the tasks based on individual interest and competence
- PPT making
- World famous Hungarians in atomic energy research
- Teller Ede (2 students)
- Szilárd Leo (2 students)
- Wigner Jenő (2 students)
- Hevesy György (2 students)
- The theory and the operating principles of the nuclear power plant (2 students)
- Comparison of the background radiation of different materials (2 students)
- Safety of nuclear power stations (discussion) (6 students)
- Pros and cons (18 students)
- Links

www.iaea.org

www.oah.hu