Effective teaching methods
design thinking at TUL

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DT4U - Design Thinking Workspace
of interdisciplinary ideas for potential implementation
at Lodz University of Technology

“Design Thinking and Problem Based Learning as an innovative learning strategy”
Lodz University of Technology

STRONG POSITION IN RANKINGS

- 4th BEST TECHNICAL UNIVERSITY IN POLAND
  Perspektywy magazine university ranking
- 4th MOST FREQUENTLY SELECTED UNIVERSITY
  according to Ministry of Science and Higher Education report
- INTERNATIONAL DOCTORAL SCHOOL OF TUL GETS LUMEN AWARD (LEADERS OF UNIVERSITY MANAGEMENT AWARD) FOR INTERNATIONALIZATION
  organized by the Perspektywy Education Foundation and PCG Polska

1535 academic staff
18698 students,
698 Ph.D. students
98000 graduates

45 fields of study, 9 faculties, 3 colleges,
International Faculty of Engineering (IFE),
International Doctoral School (IDS)
E F F E C T I V E

E D U C A T I O N
Teaching = demanding process at the level of higher education
What does the candidate expect?

What does the student expect?

What does the graduate expect?
WHAT ARE THE FACTORS A CANDIDATE GUIDES CHOOSING THE STUDIES?
Do I find a job, and how much will I earn?

Are this studies difficult? Will I handle it?

Are this studies interesting?
WHAT DOES THE STUDENT EXPECT TO LEARN?

data analysis
„What kind of skills do you consider important?”

- Technical skills (professional field related skills to accomplish specific tasks etc.)
- Virtual collaboration skills (ability to work productively in a virtual team/environment)
- Information, media and technology skills (ability to obtain and process information)
- Thinking skills (critical, analytical, strategic thinking, etc.)
- Entrepreneurial skills (flexibility, opportunity seeking, risk-taking etc.)
- Learning skills (ability to learn independently; curiosity and drive for continuous learning etc.)
- Intercultural skills (command of more than one language, work in culturally diverse teams etc.)
- Interpersonal skills (ability to work in a team, ability to manage conflicts, networking etc.)
- Personal skills (self-confidence, positive attitude, strong work ethics etc.)
- Communication skills (ability to listen, express and present ideas, ability to persuade, to negotiate etc.)
What does the candidate expect?

What does the student expect?

What does the graduate expect?

What does the employer expect from graduate?
THE USEFULNESS OF THE COMPETENCE OF THE GRADUATE IN THE EYES OF THE EMPLOYER
"Skills and competencies expected of graduates who applied for a job in your company / organization"
What kind of competences are valuable for employers?

- the ability to use knowledge in practice,
- ability to solve problems,
- ability to work in a group.

World Bank report "Skills, Not Just Diplomas"
specialized knowledge and skills
but

the growing role of general education, which is necessary to identify and solve problems embedded in a complex socio-economic reality

"Wir brauchen keine Fachidioten Wir brauchen Persönlichkeiten"

K. Hernault (Siemens)
SEFI’03 – plenary session
The T-Shaped Professional: Talent Needed for Future

BROAD:
Ability to Apply Knowledge Across Disciplines

Communication/negotiation skills
Empathy; ability to see from others’ perspectives
Creativity/Innovation
Understand substantive areas outside own expertise

DEEP
Functional Knowledge/Expertise

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Źródło: http://insights.abnamro.nl
Satisfied student is working graduate!

THE UNIVERSITY SHOULD EDUCATE SO AS TO ENSURE STUDENT COMPETENCE, WHOSE SIGNIFICANCE HE IS NOT ALWAYS AWARE, AND WHOSE EMPLOYER NEEDS, USING ALL AVAILABLE TOOLS AND METHODS
Effective teaching methods
HOW TO TEACH EFFECTIVELY?

Changes in the "structures" of the study programmes

The new approach to conduct "traditional" subject

Teaching methods based on engaging, discovering and realizing – LEARNING BY DOING
HOW TO TEACH EFFECTIVELY?

Changes in the "structures" of the study programmes

The new approach to conduct "traditional" subject

Teaching methods based on engaging, discovering and realizing – LEARNING BY DOING
TEACHING METHODS – PROJECT

Give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results.
- John Dewey

Tell me, and I'll forget.
Show me, and I may remember.
Involve me, and I'll understand
- Chinese proverb

“Play is the highest form of research.”
- Albert Einstein
WHAT DO WE HAVE AND APPLY AT TUL?
TEACHING METHODS – PROJECT – PBL

Traditional Learning

- Told what we need to know
- Memorize it
- Problem assigned to illustrate how to use it

Problem Based Learning (PBL)

- Problem assigned
- Identify what we need to know
- Learn and apply it to solve the problem

Problem
- Description of a real-life problem

Brainstorming
- What do we know about the subject? (Activate knowledge)
- Formulate learning objectives

Independent study
- Read given literature
- Find extra information
- Answer learning objectives

Exchange information
- Did we solve the problem?
- Did all group members understand everything?

New problem

Źródło: E. Bastiaens (U. Maastricht), UNICA conf., 2012
implementation

DESIGN THINKING AT TUL
TEACHING METHODS – PROJECT – Design Thinking

Diagram showing the Design Thinking process:

1. **Problem Space**
   - Creating Choices
   - Making Choices

2. **Solution Space**
   - Creating Choices
   - Making Choices

Steps of Design Thinking:

- Understand
- Observe
- Define Point-of-View
- Ideate
- Prototype
- Test

Info-Graphic of Design Thinking Steps and Mindset at SAP. Derived from Tim Brown, IDEO & HPI/D-School, Potsdam. Illustrated by Tobias Hildenbrand, SAP.
The educational experiences associated with the introduction of design thinking elements in 2010-2013 at TUL

- Informatics (I and II level)
- Computer Science (IFE) – (II level)
- Telecommunications & CS – (I level)

**I level:**
- Competence project
- PBL Team Project

**II level**
- Problem Based Workshop
- Team Project
DT4U TEAM

Graduates of Stanford University (USA) or University of California, Berkeley (USA)
DT4U at TUL - Design Thinking Workspace of interdisciplinary ideas for potential implementation at Lodz University of Technology
2012...

• an idea and first draft of DT programme for students at TUL

2013...

• DT4U workspace was ready
• programme was ready
• TUL's Children's University cooperation

2014...

• DT as compulsory subject at TUL programme
• new DT workspaces
• workshops for best students, trainings for teachers
• DESTINE Project

2015...
2015…

- DT as compulsory subject at TUL programme on 1st and 2nd study cycle
- PBL Projects with DT on IFE
- National and international cooperation

2016…

- International cooperation
- Social and business projects
- Developing academic staff – DT workshop for teachers of TUL

Need for development

Erasmus +

2014 - 2020 programme for education, training, youth and sport

DiamonDT Project - Development of Innovative AcadeMy ON the basis of DT teaching
POlishopa
Design Thinking Conference
Bydgoszcz 2016

Politechnika Łódzka
DT4U
Otrzymuj nagrodę
W konkursie
Polishopa
Honeycombs Award 2016
Zwycięstwo w kategorii
Edukacja

Bydgoszcz

Polishopa
Honeycombs Award 2016
Zwycięzca w kategorii
Edukacja
LEARNING BY DOING
design thinking = think, play, participate, learn

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- Chinese proverb

➢ Education based on teamwork, creativity and projects realization

➢ Classes activating students to learn, share knowledge and think outside the box

competences valuable for employers

Communication and learning skills, team building, project work, self-organisation

learning by doing

Action learning
Case teaching
Peer learning
Project...
Prototyping ...
Testing...
Welcome to cooperation

EDUCATION IS THE MOST POWERFUL WEAPON WE CAN USE TO CHANGE THE WORLD
- Nelson Mandela

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