BRNO UNIVERSITY OF TECHNOLOGY
FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION

DEPARTMENT OF FOREIGN LANGUAGES

DESIGN-BASED RESEARCH OF A E-COURSEBOOK FOR ESP

Eva Ellederová

CONTENTS

- Reasons for design-based research of an e-coursebook for ESP
- Concept of design-based research
- Objectives for design-based research
- Stages of research
- Research samples
- E-coursebook *English for IT*
- Evaluation criteria checklist

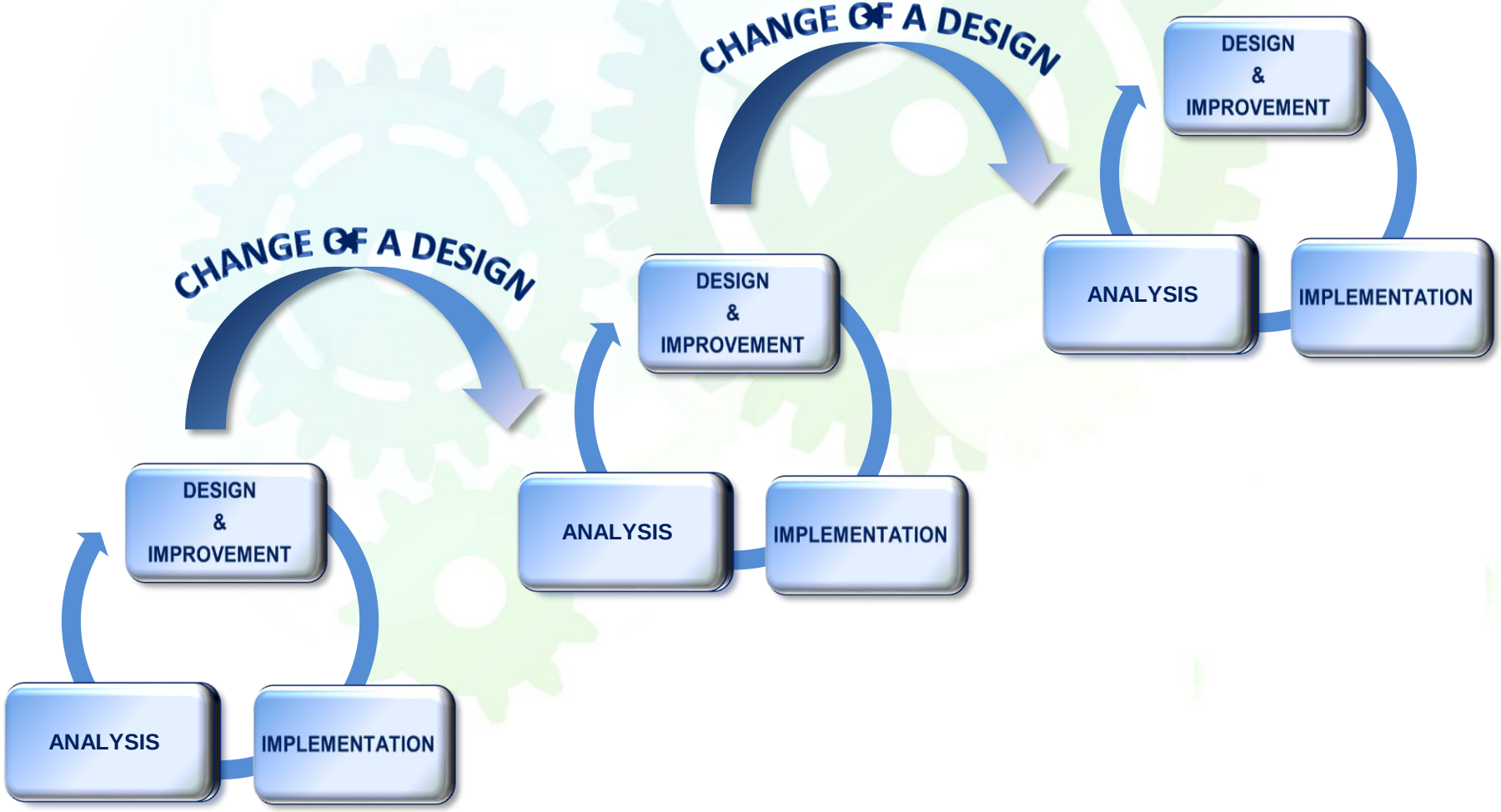
REASONS FOR DESIGN-BASED RESEARCH OF AN E-COURSEBOOK

- lack of coursebooks for ESP focused on electrical engineering and IT
- need to design a made-to-measure e-coursebook
- opportunity of experiencing the research by means of a dual role of a practitioner and a researcher

WHAT IS DESIGN-BASED RESEARCH?

- the systematic **analysis, design and evaluation of educational interventions** with the dual aim of **generating solutions** for complex problems in educational practice, and **advancing our knowledge about the characteristics of these interventions and the processes of designing and developing them**.

CONTINUAL ITERATIONS OF DESIGN-BASED RESEARCH



MAIN FEATURES OF DESIGN-BASED RESEARCH

1) Situated in a real educational context
2) Focused on the design and testing of a significant intervention
3) Uses mixed methods
4) Involves multiple iterations
6) Develops design principles
7) Involves a collaborative partnership between researches and practitioners
8) Has a practical impact on practice

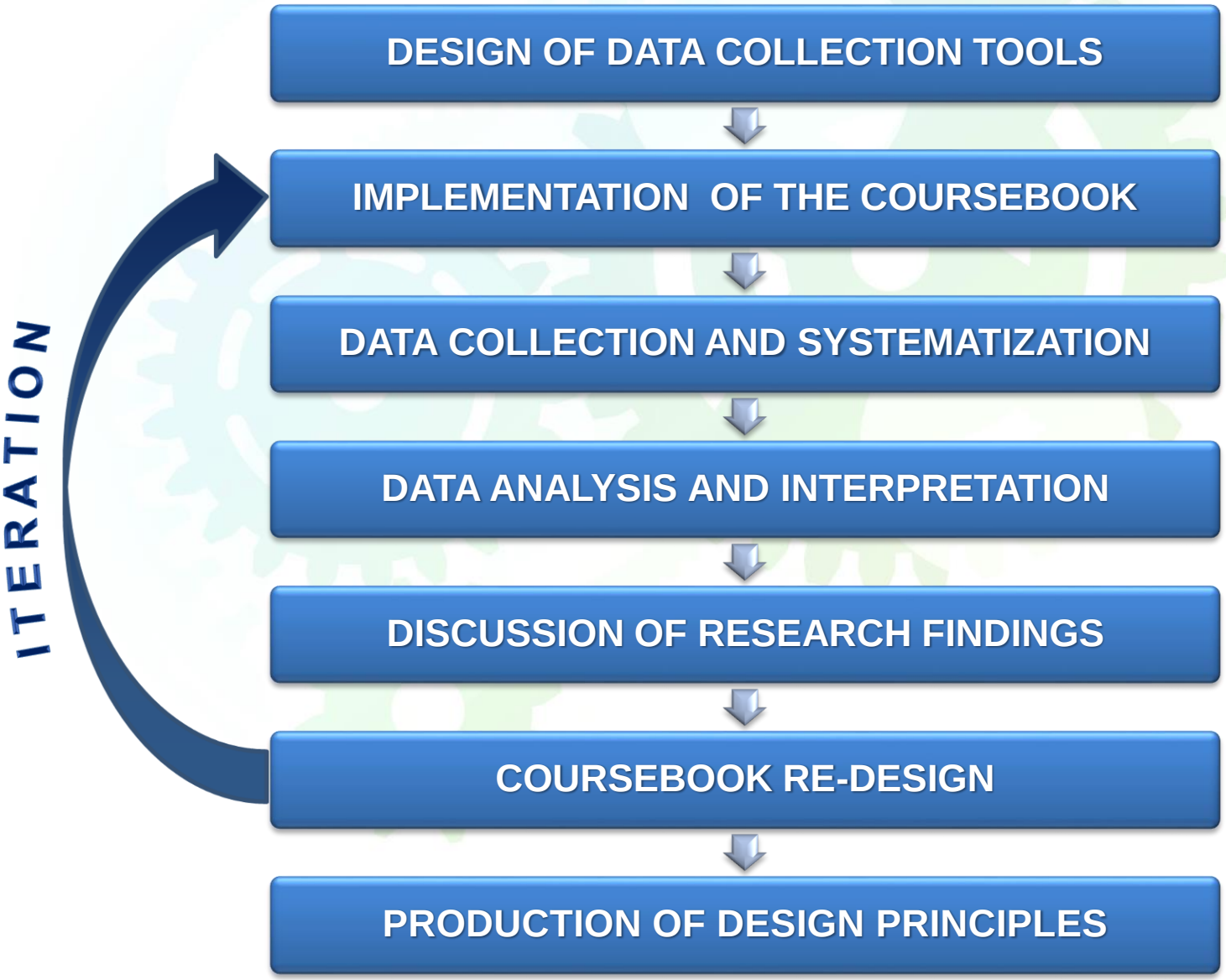
GENERAL OBJECTIVE OF DESIGN-BASED RESEARCH OF AN E-COURSEBOOK FOR ESP

- **to establish a link between the design of the coursebook and its iterative testing for the purpose of evaluation and re-design of the coursebook** so that it would be the most appropriate teaching and learning tool for the target group of students.

INTERMEDIATE OBJECTIVES OF DESIGN-BASED RESEARCH

1) **Evaluation of the coursebook**
   with the aim to collect information about its quality by means of:
   - ✓ checklists
   - ✓ didactic pre-tests and post-tests
2) **Development cycle of the coursebook**
   with the aim to optimise the coursebook quality by means of the production of:
   - ✓ substantive design principles (characteristics of the coursebook design itself)
   - ✓ procedural design principles (characteristics of the coursebook design approach)

STAGES OF RESEARCH

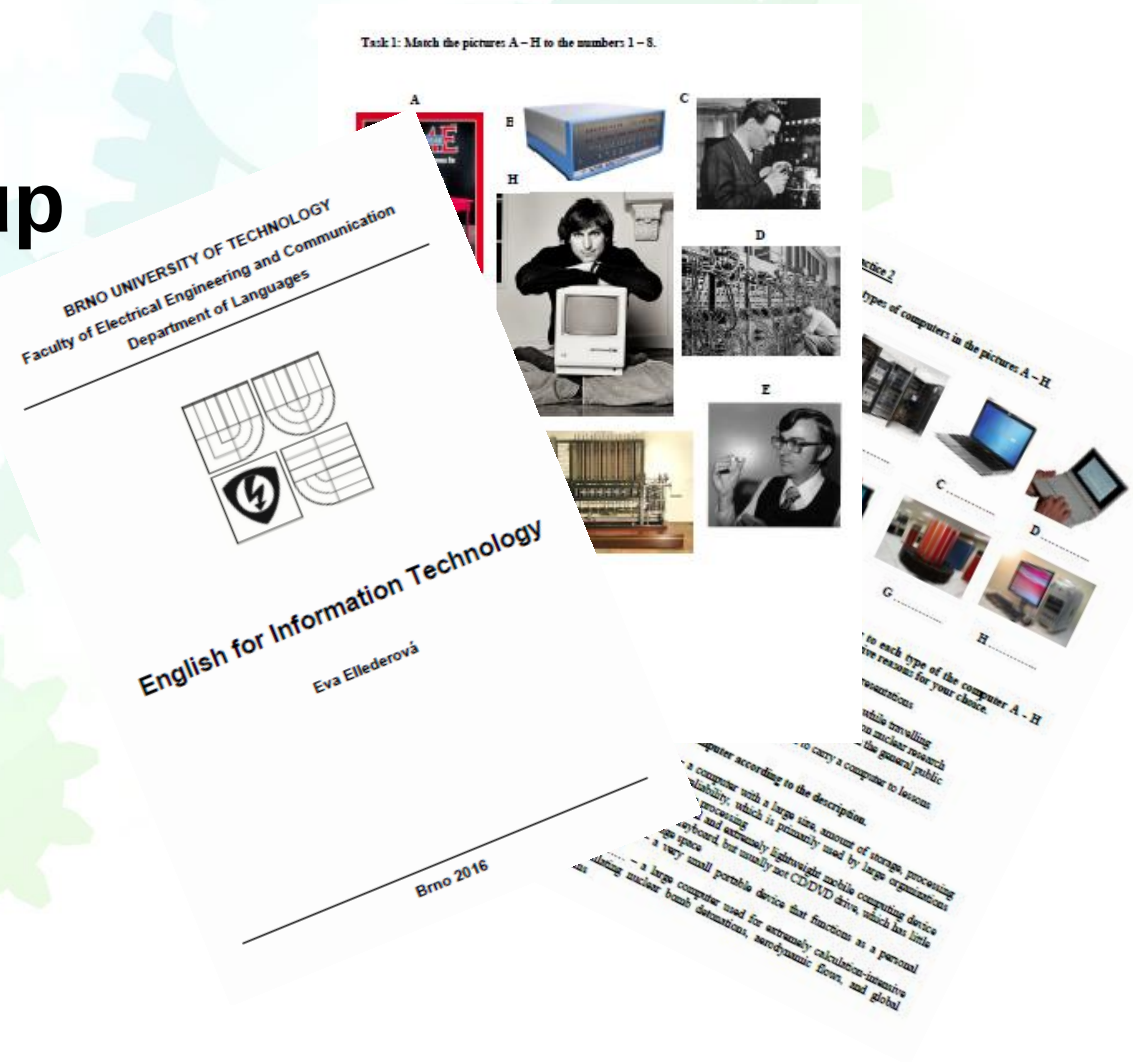


RESEARCH SAMPLES

1) **E-Coursebook** *English for IT*
2) **Students** of the first year of the Bachelor's study programme English in Electrical Engineering and Informatics at the Faculty of Electrical Engineering and Communication, Brno University of Technology
3) **English language teachers** of the Department of Foreign Languages who teach the target group of students
4) **Teachers of electrical engineering and information technology courses** who teach the target group of students in English

E-COURSEBOOK *English for IT*

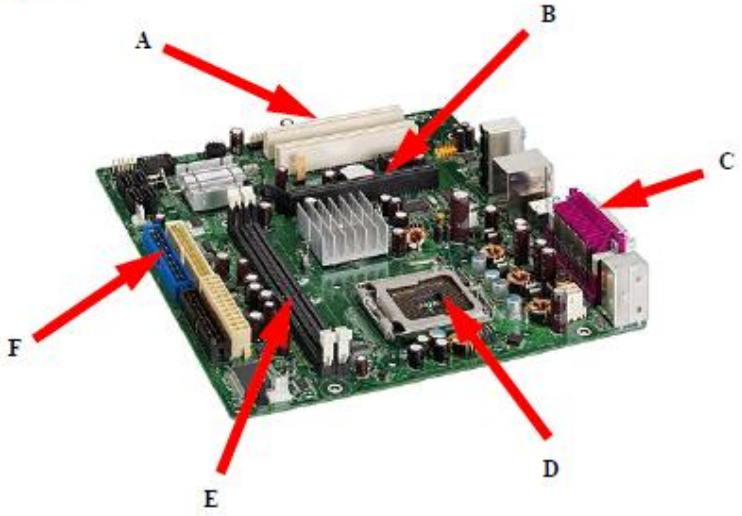
- Target group
- Objective
- Contents
- Units
- Task types



E-COURSEBOOK *English for IT:* EXAMPLES OF TASKS

Vocabulary Practice: *Motherboard*

Task 1: **Name the components 1 – 6 and arrange them onto the correct section A – F of the motherboard.**



1 ....

4 ....

2 ....

5 ....

3 ....

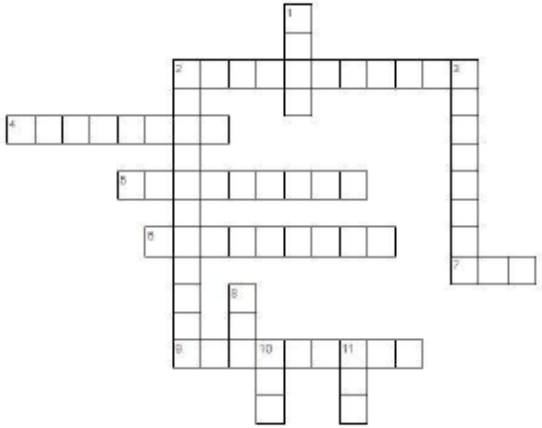
6 ....

Task 2: **Match the sentence beginnings (1 – 6) with the correct endings (A – F).**

1 The CPU processes data and .....
2 The Control Unit is the part of the CPU that .....
3 The arithmetic and logic unit is able to make .....
4 The registers are high-speed storage .....
5 Data contained in RAM is lost when .....
6 ROM memory can only be read .....

A areas within the CPU.
B you can't make changes to it.
C controls the way instructions are executed.
D the computer is turned off.
E coordinates the other parts of the computer.
F calculations: add, subtract, multiply and divide.

Task 3: **Complete the crossword puzzle with the motherboard components.**



Across

2 assists the CPU in performing certain types of operations
4 a component designed to lower the temperature of the PCU by dissipating heat into the surrounding air
5 a synonym for non-volatile
6 a wireless technology aimed at simplifying communications between devices and the Internet
7 retain their contents when power is turned off
9 a synonym for volatile

Down

1 the built-in software that determines what a computer can do without accessing programs from a disk
2 tells the computer's memory, arithmetic/logic unit and input and output devices how to respond to a program's instructions
3 a special, high-speed storage area within the CPU where all data must be represented before it can be processed
8 loses its contents when the power is turned off
10 a thin plate on which chips and other electronic components are placed
11 the part of a computer that performs all arithmetic computations

Listening: *Display Devices*

Listen to five customers in a computer shop describing their display device needs. Choose the most suitable device (A-E) for each person. Give reasons for your choice.

Speaker 1: .....
Speaker 2: .....
Speaker 3: .....
Speaker 4: .....
Speaker 5: .....

A NEC MultiSyn LCD monitor
Screen size: 17"
Resolution: 1280x1024
Aspect ratio: 5:4
Brightness: 400 cd/m^2

B Dell UltraSharp LCD monitor
Widescreen 24" flat panel
Resolution: 1920x1200
Colour support: 16.7 million
Multiple video inputs, flashcard slots and USB ports

C Cambridge-Hitachi interactive whiteboard
Allows interaction with a projected computer image
Board size: 78"
Connected to the PC via USB
Pointing device: cordless pen

D Pioneer 50" Plasma TV
Resolution: 1280x768 (XGA)
Blu-ray Disc recorder
5.1 surround sound system (Five audio channels plus one subwoofer)

E Portable projector
DLP (Digital Light Processing) technology
Resolution: 1024x768
Projection screen

Listening: *Flash Products*

Task 1:

Listen to a salesperson at his stand at a consumer electronics show describing two flash products to a potential customer. Which product (A or B) is the visitor most interested?

A The Dragon flash drive
B The Dragon MP4 player

Task 2:

Tick the features that the salesperson mentions for each device.

Features	Dragon flash drive	Dragon MP4 player
Back up computer data		
Transport files between PCs		
Audio and video playback		
FM radio tuner		
Voice recorder		
Games		

Task 3:

Answer these questions.

1 What is the storage capacity of the Dragon flash drive?
2 How do you connect it to the computer?
3 According to the salesperson, what are the advantages of a USB flash drive over a DVD or an external hard drive?
4 Some portable media players are also known as MP4 players. Why?
5 What is the screen size of the Dragon MP4 player?
6 How long does the battery last?

Problem-Solving: *Careers in IT*

Work in pairs. Study these job requirements 1 – 6 and try to match them t jobs A – F which follows.

1	2	
• at least 5 years (2 at senior level) in: Unix, Sybase or Oracle, NT or Windows 2000, Terminal Server, TCP/IP, Internet. • strong project management (2 years) • willingness to travel abroad	• able to manage, lead and develop a team • knowledge of C, C++, Delphi • experience of object-oriented design within a commercial environment • ability to deliver software projects against agreed schedules and within agreed estimates	• proven track re delivery of e-sc banking enviro • knowledge of U Oracle • willingness to t internationally
4	**5**	
• minimum 4 years lifecycle development experience • demonstrable skills using VB, SQL, RDBMS • able to develop core s/w • excellent communication skills	• minimum of 18 months commercial experience of Web development • knowledge of HTML, Java, ASP • full portfolio of URLs as examples	• experience of N SQL Server, M Software, Vert • solid grasp of n • 2 to 5 years' ex network enviro

A ….. Visual Basic Developer
B ….. IT Engineer (Network & Database)
C ….. Web Developer
D ….. Network Support
E ….. E-commerce Consultant
F ….. Team Leader

Speaking

Role-play a job interview between an interviewer and a candidate for one from the previous exercise.

Student A: You are an interviewer. Ask questions from the section "Language f

Student B: Choose one of the jobs and answer the interviewer's questions.

Speaking: *Web Browsers*

Task 1:

Discuss what the picture shows. What do the three boys represent? Why are they pictured like this?

Task 2:

Discuss and list the advantages and disadvantages of Internet Explorer, Opera, Firefox, Chrome and Safari.

Speaking: *Windows Basics*

Task:

In pairs, compare the Windows 8 user interface with the Mac OS X user interface.

What are the similarities and differences?
Which features do you prefer from each interface?

EVALUATION CRITERIA CHECKLIST

I. General aims of the coursebook:

– To what extent do the aims of the coursebook correspond to the course aims concerning the **language use** and **professional content**?

II. Clear arrangement:

– Are the **external layout** (logical sequencing of chapters, topics, vocabulary) and **internal layout** (texts and tasks) clear?

III. Adequacy:

– Is the level of texts and tasks adequate to the **language level of students**?

– Is the level of texts and tasks adequate to the **professional level of students**?

EVALUATION CRITERIA CHECKLIST

IV. Learning guidance

- Are different **text features for guiding attention** used in the coursebook? (e.g. different typefaces for distinguishing types of subject matter, bold print for highlighting key vocabulary)?
- Do the tasks require **problem solving**?
- Does the coursebook contain **pairwork, groupwork, individual work tasks** (including the key for self-monitoring)?
- Do the **visuals accompany tasks** or are they used only for decorative purposes?
- Does the coursebook contain enough **tasks for recycling and reinforcement**?

EVALUATION CRITERIA CHECKLIST

V. Motivational characteristics:

- Are the **topics** in the coursebook **authentic**?
- Do the **topics** relate to **study and professional purposes**?
- Does the coursebook equip students with **skills and strategies** for **effective communication in professional and occupational situations**?
- Are texts and tasks **interesting for students**?

EVALUATION CRITERIA CHECKLIST

VI. Language content:

- Is the **range of professional vocabulary** in the coursebook **adequate**?
- Does the coursebook **support vocabulary learning strategies** (e.g. presentation of vocabulary in the text, tasks, with visuals)?
- Does the coursebook contain sufficient material for students to **acquire language functions** (e.g. description, classification, comparison)?

EVALUATION CRITERIA CHECKLIST

VII. Language skills:

- Is **reading** material **adequately covered**?
- Is there a focus on the **development of reading skills and strategies**?
- Is **listening** material **adequately covered**?
- Is there a focus on the **development of listening skills and strategies**?
- Is material for **speaking adequately covered**?
- Is material for **speaking** (dialogues, role plays, etc.) well designed to **equip learners for real-life interactions**?

REFERENCES

- Cunningsworth, A. (1995). *Choosing your coursebook*. Oxford: Macmillan.
- Tomlinson, B. (Ed.) (2008). *English language learning materials. A critical review.* London: Continuum.
- Plomp, T., & Nieveen, N. (Eds.). (2013). *Educational design research*. *Part B: Illustrative cases.* Enschede: SLO – Netherlands Institute for Curriculum Development.
- Van der Akker, J. (Ed.). (2006). *Educational design research.* Abingdon: Routledge.

Thank you for your attention.