

# Teachers' Professional Development on Problem Solving

Theory and Practice for Teachers and Teacher Educators

Judit Orgoványi-Gajdos



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**Judit Orgoványi-Gajdos**

*Eszterházy Károly University of Applied Sciences, Hungary*



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## TABLE OF CONTENTS

Acknowledgements	vii
Introduction	ix
Chapter 1: Problem Solving as a Cross-Curricular Skill of Teachers	1
Teachers as Decision Makers	1
Teacher and Teaching Competencies	2
Teacher Expertise	4
Teachers as Problem Solvers	6
Chapter 2: Teachers' Challenges and Professional Development in Different Stages	9
Preservice Stage	10
New Teacher Stage	13
Experienced Teacher Stage	17
Chapter 3: Main Features of the Training Programme for Teachers' Professional Development on Problem Solving	21
Context and the Main Aim of the Programme	21
The Approaches of the Problem in the Field of Education	21
Teachers' Knowledge of Their Practice	24
Reflecting Thinking and Reflective Teaching	26
Thinking Frameworks and Tools	29
Self-Case Reflection	30
Constructivism and the Role of Teacher Educators	34
Pair Peer Coaching	34
Outcomes of the Programme	35
The Structure of the Training Programme	36
Chapter 4: Training Programme for Teachers' Professional Development on Problem Solving: Course Activities and Materials	37
1st Block: Welcome and Introduction	37
2nd Block: Teacher Roles, Competencies and Developmental Needs	42
3rd Block: What Does Problem Mean? (Problem, Challenge, Task)	48
4th Block: How Does the Problem Solving Process Work?	53
5th Block: Why Is It a Problem for Me? (Perception, Problem Identification and Stating the Goal)	59

TABLE OF CONTENTS

6th Block: What Could Be the Reason of this Problem? (Information 1)	64
7th Block: Facts and Opinions (Information 2)	68
8th Block: Collecting Alternative Solutions (Possibilities 1)	72
9th Block: Generating New Solutions (Possibilities 2)	79
10th Block: How Do I Choose? (Decision Making)	84
11th Block: Planning, Performing, and Evaluating	89
Appendix	95
References	123

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## INTRODUCTION

Being a teacher in the 21st century is not an easy task. Recent changes in society, economy and politics have had a huge effect on mass education. Such basic questions of compulsory education as “Why and what to teach, how to teach and to whom?” are more timely than ever. The changing roles of teachers, the growing demands and expectations of society and policy makers require high quality teacher education and professional development.

Since teaching is a practical activity, efficient problem-solving skill is one of the fundamental competencies teachers need to possess. Teachers often face challenges at all levels of their professional development and they need to learn to cope with their current problems. It is why necessary that teachers possess tools and techniques that help them in this process. Instead of giving hints in certain situations this book provides conceptual thinking patterns for finding one’s own answers and solutions of the actual pedagogic situation.

The book is divided into four main chapters. The first two chapters provide further legitimation to the outlined program including the synthesis of related international surveys results pertaining to the connection of teaching and problem solving. The third chapter deals with the main features of the Training Programme for Teachers’ Professional Development on Problem Solving while the fourth includes the well-designed programme itself with full of practical activities for developing teachers’ problem solving skills by given conceptual frameworks and thinking techniques. Practical activities presented in the programme can help teachers to frame their perceptions of events, to identify their challenges, to find the core of the problematic situations, to analyse their situation, and also to find their own solutions. The book is therefore more than a collection of adopted and self-developed tools. The respective programme is based on a step-by-step problem-solving, oriented-thinking process and utilizes the most important theories in the field of pedagogy and psychology.

The proposed schemes are basically intended for self-case-based group work and can be successfully used as a part of the (preservice or in-service) teacher education process. The book material can be used as a separate course but it can also be embedded in an existing course that deals with pedagogic cases and the challenges of the teaching and learning process.

Although most of the tools can also be used individually by teachers at any stage of their career and including any type of compulsory education thanks to the clear descriptions of each techniques. The Appendix contains photocopiable sample material that can ease the usage of the tools.

The book concentrates on the following approaches:

- reflective teaching
- self-directed development

## INTRODUCTION

- experimental learning by self-case reflection
- teaching as a life-long learning process
- constructivism
- practice-based teacher education and in-service training
- active and interactive participation

The program was developed during an Educational Design Research of a PhD dissertation and the respective approaches were tested by the author in Eszterházy Károly University of Applied Sciences in Eger, Hungary in 2015. More than 140 prospective and experienced teachers were involved in the research from all teaching levels (pre-primary/primary/secondary) including participants with differences in age, teaching experience, and subject.

## CHAPTER 1

# PROBLEM SOLVING AS A CROSS-CURRICULAR SKILL OF TEACHERS

### TEACHERS AS DECISION MAKERS

Research into the cognitive process of teachers has become a promising field of scientific inquiry since the 1970s. A crucial research program on teachers' thinking was led by Shavelson (1973), who claimed that one of the basic skills is decision making: "Any teaching act is the result of decision, whether conscious or unconscious" (Shavelson, 1973: 144). Lampert (1999) went further and spoke about teachers as "dilemma managers," who are supposed to be making choices and decisions during every aspect of the teaching-learning process. More researchers emphasize the complexity and responsibility of teachers' decisions because they cannot be separated from any aspect of the teaching context (see Calderhead, 1993; Reagan et al., 2000; Hammernes et al., 2005). Reagan et al. (2000:25) consider the teacher "first and foremost a decision maker who must make decisions consciously and rationally."

Concerning teachers' cognitive process (thought) and its timed connection to their classroom behaviour (action), several experts make a distinction between "pre active", "interactive" (Jackson, 1968) and "post active" phases (Clark & Peterson, 1986). Similarly to these phases, Killon and Todnem (1991) expanded Schön's (1983) categories and spoke about "reflection in action" (interactive phase), "for action" (before interactive phase) and "on action" (after interactive phase). The decision making process of teachers therefore has two main types depending on the interactive and planning (pre-/postactive) phase of teaching. Other researchers define classroom teaching (interactive phase) as a multidimensional task, which is quite complex and demanding (Doyle, 1979; Lampert, 2001; Hammernes et al., 2005). They claim that teachers are supposed to combine many elements of group management and the learning process and they have to condense their response into one action. This multidimensional dynamic of classroom events does not let teachers think and reflect on situations for long time, therefore decisions in the interactive phase are quick, usually unconscious, and routinized (Broadbent, 1977; Doyle, 1979; Sutcliffe & Whitfield, 1979; Brown & McIntyre, 1993).

In the phase of assessing and planning teachers make long-term decisions. "The teacher makes curricular decisions, methodological decisions, decisions about individual children and their needs and problems, decisions about classroom management and organization, decisions about both personal and professional ethics, and so on" (Reagan et al., 2000: 19). These decisions are more conscious

CHAPTER 1

and knowledge-based than decisions during classroom teaching (Broadbent, 1977; Sutcliffe & Whitfield, 1979; Rasmussen, 1985).

While the main characteristic features of teachers' decision types are outlined in [Table 1.1](#), it is important to note that the two aspects are linked and affect each other often without any significant difference between them.

*Table 1.1. Features of teachers' decision-making situation and the respective process*

	<i>Features of teachers' decision-making situations and the respective process</i>	
	<i>During the interactive teaching-learning process</i>	<i>During the planning process</i>
<i>Time of decision (Jackson, 1968; Clark &amp; Peterson, 1986)</i>	During action ("interactive")	Before and after action ("pre-active"; "post-active")
<i>Duration of decision-making process (Sutcliffe &amp; Whitfield, 1979)</i>	"Short-term" decision-making process	"Long-term" decision-making process
<i>Level of consciousness (Broadbent, 1977)</i>	Mainly unconscious, routinized decision ("out of awareness")	Conscious decision ("with awareness")
<i>Selection of decisions and type of thinking, (Brown &amp; McIntyre, 1993; Claxton, 1997)</i>	Immediate, spontaneous selection made by routine "Rapid thought" (instantaneous reaction to the multitude, of demands) Schematic thinking by using recipes	Planned selection and strategic thinking "Deliberative thought" (thinking over the features of the situation and the alternatives)
<i>Belief system (Kansanen, 1995)</i>	Intuitive base	Rational base
<i>Competency (Rasmussen, 1985)</i>	Behavioral (Skill-based)	Cognitive (Knowledge-based)
<i>Type of reflection (Schbn, 1983; Killion &amp; Todnem, 1991)</i>	"Reflection in action"	"Reflection on action" and "reflection for action"

TEACHER AND TEACHING COMPETENCIES

To be able to clarify teachers' requirements and what they are supposed to do, the elaboration of competence frameworks was needed (Ingvarson, 1998). Koster and Dengerink (2008) define teacher's competence as "the combination of knowledge, skills, attitudes, values and personal characteristics, empowering the teacher to act

professionally and appropriately in a situation, deploying them in a coherent way” (European Commission 2011: 7).

Researchers from OECD countries (see 2009b) systematically distinguish between *teacher and teaching competencies*. The former refers to the “*multi-faceted roles of the teacher on multiple levels*” such as the individual student level, the classroom level, the school level, and the level of parents or the wider community (see [Table 1.2](#)).

*Table 1.2. Teachers’ responsibility on different level*

---

<i>At the individual student level:</i>
<ul style="list-style-type: none"> <li>• Initiating and managing learning processes</li> <li>• Responding effectively to the learning needs of individual learners</li> <li>• Integrating formative and summative assessments</li> </ul>
<i>At the classroom level:</i>
<ul style="list-style-type: none"> <li>• Teaching in multi-cultural classrooms</li> <li>• New cross-curricular emphases</li> <li>• Integrating students with special needs</li> </ul>
<i>At the school level:</i>
<ul style="list-style-type: none"> <li>• Working and planning in teams</li> <li>• Evaluation and systematic improvement planning</li> <li>• ICT use in teaching and administration</li> <li>• Management and shared leadership</li> </ul>
<i>At the level of parents and the wider community:</i>
<ul style="list-style-type: none"> <li>• Providing professional advice to parents</li> <li>• Building community partnerships for learning</li> </ul>

---

*Source: OECD, (2005: 97–99)*

The latter one, called teaching competencies, refer to the type of knowledge, skills (proceed from Shulman’s categories, 1987) and values that one needs to possess for lesson planning, for setting an appropriate classroom environment, and for managing the learning process of the students (see [Table 1.3](#)).

Standard-based approach of teaching, teacher education and professional development usually combines the two aspects mentioned above (OECD, 2011b). Taking the standards of countries it is clear that the teaching-learning process and the role of the teachers are complex issues. Each country has elaborated its own descriptions and approaches for describing teachers’ competencies (standards), thus the more countries are involved, the more standards have been developed. The variable form of these standards show the complexity of the theoretical and practical part of teachers’ work and its declaration.

*Table 1.3. Teaching competencies**Knowledge:*

- pedagogical subject knowledge
- pedagogical knowledge
- curricular knowledge
- educational sciences foundations (intercultural, historical, philosophical, psychological sociological knowledge)
- contextual, institutional, organizational aspects of educational policies
- issues of inclusion and diversity'
- new technologies
- developmental psychology
- group processes and dynamics, learning theories, motivational issues
- evaluation and assessment processes and methods

*Craft skills:*

- planning, managing and coordinating teaching
- using teaching materials and technologies
- managing students and groups
- monitoring and assessing learning

*Values:*

- epistemological awareness (i.e. about relevant issues of the features and historical development of the subject area and its status, as related to other subject areas)
- dispositions to change
- commitment to promoting the learning of all students
- dispositions to promote students ' democratic attitudes and practices, as future European citizens
- dispositions to flexibility and ongoing learning
- dispositions to examining, discussing, questioning one's own practices.

*Source: McDiarmid & Clevenger-Bright, 2008 cited in European Commission (2011: 27–28)*

## TEACHER EXPERTISE

The previous chapter focused on what teachers' high level of content knowledge mean. However researches efforts focusing on expert and novice teachers claim that being an expert in a field means a special integration of a high level content knowledge along with possessing general problem solving skills. Problem solving skill is strongly connected to such general cognitive and metacognitive processes as perception and representation of the problem, reasoning, gathering information, analysing, creating solutions, decision making, planning, reflecting and evaluating (see De Groot, 1966; Chase & Simon, 1973; Simon & Gilmarin, 1973; Chi et al., 1981; Chi et al., 1982; Larkin et al., 1980; Bransford, Brown, & Cocking, 2000; Eysenck & Keane, 2010).

Researches of expert and novice teachers' behaviour and thinking process pointed out the same differences between the two groups like researchers have done

PROBLEM SOLVING AS A CROSS-CURRICULAR SKILL OF TEACHERS

*Table 1.4. Key differences between expert and novice teachers*

<i>Aspect</i>	<i>Novice teacher</i>	<i>Expert teacher</i>
<i>Knowledge construction</i>	Isolated elements of knowledge; Low level of knowledge transfer	High level and well-integrated content knowledge; Successful knowledge transfer
<i>Type of and amount knowledge</i>	High amount of declarative and little procedural knowledge	High amount of declarative, procedural and situated knowledge
<i>Lesson planning</i>	Short-term and very detailed planning bounded very strongly to curricula, rules and models	Long-term and less detailed planning taking notice of former knowledge, and individual features of student and the learning group; Independency during lesson planning
<i>Classroom perception</i>	Missing skill of divided attention; The perception of little amount of information; Perception and procession of information one-by-one	Successful perception of high amount and synchronic information of classroom scene; Fast and effective information selection; Recognition of deep patterns behind classroom events
<i>Class management</i>	Missing element of scematic thinking and routinalized behaviour; Following former teachers' habits (experienced from student view)	High level of flexibility; Modulating lesson according to the learning environment, group features and student individual skills; High level of improvisation skill scematic thinking and routine
<i>Focus of teaching-learning process</i>	Self-centred approach	Learning and student-centred approach
<i>Problem solving</i>	Surface-level of classroom event interpretation; Short-term solutions	Complex and shopisticated representation of pedagogical problems; Deep-level of classroom event interpretation; Long-term solution based on the cause of the problem; Taking more emphasis of prevention of the possible classroom problems



## CHAPTER 1

on other field. The [Table 1.4](#) sums up the main results of these inquiries (based on Fuller, 1974; Tsui, 2009; Carter, 1990; Berliner, 2004; Hogen & Rabinowitz, 2009).

According to OECD, the key features of teacher expertise include the “routinisation of teaching activities, the sensitivity to social demands and the recognition of classroom dynamics; flexibility and improvisation; understanding problems; domain-and subject- specific expertise in recognising patterns in the complexity of classroom life” (European Commission, 2011: 15).

All in all in addition to content knowledge, general problem solving skill is also an important part of expert teachers’ competencies (Glaser, 1987; Tsui, 2003).

### TEACHERS AS PROBLEM SOLVERS

The complexity of the teaching profession is reflected by the elements detailed in the previous chapter. They include:

- the differentiation of pre-, inter- and post-active phases of the teaching process (planning, acting, evaluating) (Jackson, 1968; Clark & Peterson, 1986; Killon & Todnem, 1991)
- the multidimensional setting of the interactive phase (classroom situations) (Doyle, 1979; Lampert, 2001; Hammernes et al., 2005)
- the multiple level (society, school, classroom, student) of the teaching task (OECD, 2005)

To be able to respond to all of the challenges the profession holds, teachers are required to have a wide range of competencies. However that is why several experts claim that problem solving (including decision making) is the key feature in the profession. “Teaching is viewed as consisting of practical problems, requiring deliberation and action for their solution” (Calderhead, 1989: 44). “Teachers must be prepared to handle unanticipated situations, to adapt current knowledge to deal with new problems, to learn radically new things in short, to deal constructively with change” (Silverman & Welty, 1990: 95). According to many researchers, teachers solve problems not only during the interactive, classroom teaching phase but also when they evaluate the previous lesson and plan for the next. In this respect, the whole pedagogical process, starting with planning and concluding with (self)evaluation, is seen as analysing, acting, reflecting, making decisions and solving problems (Shavelson, 1973; Calderhead, 1989, 1993; Adler, 1991; Kirby & Teddlie, 1989; Silverman & Welty, 1990; Zeichner & Liston, 1996; Lampert, 2001). Every element of the teaching profession is therefore permeated by problem solving: “Teaching is increasingly seen as a professional activity requiring a careful analysis of each situation, choice of objectives, development and monitoring of suitable learning opportunities, evaluation of their impact on students’ achievement, responsiveness to students’ learning needs and a personal or collective reflection on the whole process” (OECD 2005: 99). To sum up the results of researches about teachers’ competence and problem solving skills the success of the pedagogical

## PROBLEM SOLVING AS A CROSS-CURRICULAR SKILL OF TEACHERS

problem solving process therefore depends on such personal and professional factors as:

- the combination of different knowledges
  - professional theoretical knowledge (about general psychological and pedagogical facts, teaching-learning process, curriculum, students' needs etc.);
  - professional practical knowledge (about teaching practice – e.g. general classroom situations, students' behaviour, communication with parents, colleagues etc.)
  - knowledge of (the) self (e.g. own personality, own problem solving strategies, professional aims, professional strengths and weaknesses etc.);
  - knowledge of the problem solving process (different steps and techniques of the process),
  - knowledge of the current situation (facts, circumstances, own role, involved persons etc.);
- the combination of different skills
  - general thinking skills (divergent and convergent thinking, system thinking, metacognition, reflective thinking etc.)
  - professional skills (teacher and teaching skills – e.g. lesson planning, classroom management, communication, evaluation etc.)
  - problem solving skills (problem identification, goal setting, information gathering, situation analysing, developing alternatives, decision making, implementing)
- motivational factors
  - emotions (current emotion relating the actual problem)
  - beliefs (about the role of the school, teaching-learning process etc.)
  - attitudes (toward the problem, toward the job itself, toward own role as a teacher, toward the involved persons e.g. students, the parents, the colleges and the management etc.)

Since problem solving skill can be the link between knowledge and action, declarative and procedural knowledge, therefore it has an important knowledge transfer role, too. It includes divergent (creative or lateral) and convergent (critical) thinking processes (see [Figure 4.4.2](#)), as well as systems thinking (De Bono, 1966; Treffinger & Isaksen, 2004).

All things considered, it is important to note that a given problem solving skill is not related to a special competence: instead, it is interlinked with all the key teacher and teaching competences as a cross-curricular one. Therefore it should be one of the indispensable high-level skills teachers need in order to be able to answer all the challenges they face on every level and every aspect of the profession. “Professionals can frame and reframe a problem as they work on it, testing out their interpretations and solutions, combining both reflection and action” (Calderhead, 1989: 44).

## CHAPTER 2

### **TEACHERS' CHALLENGES AND PROFESSIONAL DEVELOPMENT IN DIFFERENT STAGES**

What kind of challenges do teachers come across at different stages of the profession? Why is it important to restructure the problem solving thinking process on every level of teaching practice? How can the Training Programme for Teachers' Professional Development on Problem Solving foster (future) teachers to answer their challenges? This chapter aims to answer these questions.

According to Day the word of professional traditionally includes a specialized knowledge; commitment; collective identity; professional standards and professional autonomy (Day, 1999). Sellars (2014: 23) in her study sums up several criteria behind the concept of the professional. She asserts that teaching is a profession in a sense that it is a kind of social work demanding preparation and professional development. Moreover, she adds that it has its own standards and assessment of the activities, and provides a well-structured career.

Researchers of teacher careers described the teaching job as a profession with different developmental stages. Many accounts demonstrated how teachers' professional life cycle could change according to the influence of personal, professional and contextual factors. Most of them resorted to a model comprising three to nine interrelated, yet different phases (see Berliner, 1988; Fuller & Brown, 1975; Bruke et al., 1984; Sikes et al., 1985; Leithwood, 1990; Bolam, 1990; Fessler & Christensen, 1992; Huberman, 1993; Hammerness et al., 2005; Tsui, 2007).

Based on the system of European Commission (2010) I consider teachers' professional development as a three key-stage process. This chapter therefore examines the development of teachers' challenges and problem solving skills in light of three vital steps: The first step is called the Preservice stage: "the preparation of teachers during initial teacher education, where those who want to become a teacher master the basic knowledge and skills." The second step is the so-called New teacher stage: "the first independent steps as teachers, the first years of confrontation with the reality of being a teacher in school." The third step is the Experienced teacher stage: "the phase of the continuing professional development" (European Commission, 2010: 6).

PRESERVICE STAGE

*Who Are on This Stage?*

Becoming a teacher is a life-long process that formally begins with participating in teacher education. Those who are involved in this initial preparation get some teaching experience as student teachers (or as it is called prospective/future teachers) at the end of the training and they are aided by a mentor or an associate teacher during the process. The candidate at this stage is therefore supported externally (Glaser, 1996). It is basically a learning period when candidates can try to manage the real teaching-learning process for the first time and they can start to create their professional identity with very few responsibilities. One of the main advantages of this preservice period is that candidates have time to construct theoretical and practical knowledge and to develop those skills they need to be able to start working as a teacher. However, as every stage of this profession, it can also have many challenges.

*The Main Challenges of Student Teachers*

The challenges that prospective teachers are about to face can be divided into three groups.

*“Learning like a student, teaching like a teacher”*. Student teachers have a relatively intermediate role as they are between the stage of a student and of a teacher. They feel and learn like a student but they have to act as a teacher. However as a student teacher they are neither students nor teachers it can therefore cause some difficulties for candidates to identify themselves: (Fuller & Brown, 1975; Volkmann & Anderson, 1998; Pillen et al., 2013a, 2013b, 2013c). They are constantly observed by peers, associate teachers, and students which can also lead to a disturbing situation. Differences between mentors’ instructions and theories or methods taught in universities were also well-documented (e.g. Black & Halliwell, 2000).

*The multidimensional classroom and teacher-orientation perspective*. Even if preservice teachers have more than a decade of classroom experience as being a student, this student view does not let them see the classroom teaching process and the teacher ‘s task as a complex one. So as student teachers it is the first time they meet the multidimensional phenomena of the classroom at the teacher side and they can notice that teaching itself is quite different from what they had experienced as a student (Doyle, 1979; Lampert, 2001; Hammernes et al., 2005). Since teacher candidates have very few teaching hours they have no routine or schemata therefore they usually resort to very self-centred approaches in the classroom (Fuller, 1974; Tann, 1994).

*Knowledge transfer.* “In most forms of professional preparation, there exists a continuing tension between the realities of current practice and the ideals of desired reforms” (Shulman, 1992: 8). Several experts claimed that teacher candidates have difficulties in connecting theory (pedagogy and psychology taught in university courses) and classroom practice due to the missing element of knowledge transfer (Corcoran, 1981; Wubbels, Korthagen, & Brekelmans, 1997; OECD, 2005). Kennedy (1990) named this phenomenon “the problem of enactment”.

*The Main Dilemmas and Directions of Teacher Education Models*

Most aspects of teacher education make the candidate focus on “learning to know as a teacher” (European Commission, 2013: 12). Therefore, this preparation mainly aims at expanding candidates’ knowledge of the key elements of the teaching-learning process and the test of this knowledge in school practice. Less time is devoted to developing practical skills and forming values that drive teachers’ practice. This poses a significant challenge to teacher trainers contemplating potential developments of teacher education programs. The next section outlines several important conditions for a more candidate- and practice-centred preparation since it is the first common point in the teaching career.

*Dealing with the prior knowledge of prospective teachers.* Future teachers have initial knowledge about teaching practice because they had been students themselves in a previous compulsory education framework. This former knowledge influences their preconceptions, beliefs and visions about the teaching-learning process. Teacher education needs to deal with these pre-cognitions: on the one hand, it should integrate these useful experiences and, on the other hand, it should help to eliminate some misunderstandings and should generate conceptual changes utilizing the fact that this knowledge was built from student views (Clark & Peterson, 1986; Wilson, 1989; Calderhead, 1989, 1991; Lortie, 1975; Hammerness et al., 2005).

*The discrepancy between theory and practice.* Despite the considerable differences in teacher preparation programmes worldwide, all of them share a common factor: the aim of the preservice stage is that student teachers learn to apply their theoretical knowledge in a practical context. However, more studies highlighted the separation of teacher education courses and their slight connection to everyday school practice (see Lanier & Little, 1986; Barone et al., 1996; Zeichner, 1996; Kennedy, 1999; Korthagen & Kessels, 1999; Black & Halliwell, 2000; Hagger & McIntyre, 2006; Vick, 2006). These facts cause law effect of initial preparation compared to teachers’ former experiences and own teaching practice (Feiman-Nemser, 2001).

The above mentioned problems can be in rapport with so called traditional (university-based) teacher education or with other expressions: “Technical-rationality model” Schön (1983), “Application of theory model” (Russell & Korthagen, 1995),

“Theory to practice model” (Carlson, 1999). It is based on the conception that preservice teachers first take part in theoretical preparation by university courses that last more years and only after that they go for longer practice in real school setting (Wideen, Mayer-Smith, & Moon, 1998).

To be able to reduce the “theory-practice gap”, a movement came into existence from the 90’s that emphasized the “situative perspective” of teaching and future teachers’ learning process (Borko, 2004). This practice-focused view confirmed the necessity of field-based or in other words: “school-based teacher education” (Ashton, 1996; Zeichner, 2010; Korthagen, 1992; McIntyre, 1994), or “workplace-situated teacher education” (van Velzen et al., 2012). This approach was based on the theory of learning by doing (Kolb, 1984) and learning by reflection (Calderhead, 1989). It declared that “teachers learn best by studying, doing, and reflecting; by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see” (Darling-Hammond, 1998: 8).

This view stresses the fact that student teachers need to develop their procedural knowledge by learning in and from practice besides preparing for practice (Harrington, 1995; Ball & Cohen, 1999; Adler, 2000; Marsh, 2002; Hammernes et al., 2005; Ball et al., 2009; Borko, 2009). When the classroom becomes the main learning environment for future teachers it gives a chance to learn what it means to feel, act, and think as a teacher in authentic context (McIntyre, 1994; Ball & Forzani, 2009; OECD, 2013). Korthagen et al. (2001) claimed that these models are actually “realistic approaches”. They asserted that there are several advantages of school-based preparation: it gives the opportunity of continual reflection; it provides multi-level integration of knowledge and disciplines while transferring theory into practice, it supports peer-interactions and close relationship between candidates and educators; moreover, teacher candidates can meet each other while experiencing and working on authentic practical problems in their real day-to-day context.

Field-based preparation can provide a “form of teacher education which enables teachers to develop technical competence but also to be able to analyse their practice, to become aware of the ethical and moral assumptions within this practice and be able to direct their own professional growth not to speak about the development of the educational environment in which they actually work” (Zeichner & Liston, 1987 cited by Calderhead, 1989: 45). Pre-service training could therefore be more than an “uneasy mixture of theoretical prescription and trial and error practice” (Brown & McIntyre, 1993: 13).

However it should be taken into account that field-based initial preparation requires strong collaboration between university and schools as well as a new structure and curricula of teacher education (Ball & Cohen, 1999; Ball & Bass, 2003; Grossman & McDonald, 2008). One of the changes of the structure can be a special type of employment where the student teacher is employed as a teacher (Buitink, 2009).

While there is a world-wide tendency of a shift from theory-base to practice-base, from university-based to school-based teacher education, the question about the best way for preparing students for the teacher role is still open.

#### *The Contribution of the Problem Solving Program*

The professional challenges of the student teacher stage and the expectation of becoming an effective teacher require the development of problem solving skills from the initial phase of the teaching career as Silverman says: "Students must have the opportunity to bridge the gap between theory and practice. To do this, they must be encouraged to become thoughtful, creative problem solvers. Students need practice in analysing problems, asking important questions, considering various responses, arguing for or against different solutions, and seeking more than one answer to a problem. To become successful teachers, they will need to learn to think through problems so that they can arrive at effective solutions" (Silverman, 1990: 95).

The Problem Solving Program (presented in this book) can be a useful supplement to student teachers' practical preparation as it supports:

- deeper observation of classroom events
- viewing school events as a coherent process
- using conceptual frameworks and techniques
- thinking through own pedagogical experiences
- analysing the background of the pedagogical problems
- linking course-based and fieldwork components
- connecting the theoretical and practical elements of mass education
- integrating different connected disciplines
- conscious reflection and self-directed learning process.

#### NEW TEACHER STAGE

##### *Who Are New Teachers?*

I consider new teachers (or novice/beginning teachers) as people with no more than three years of teaching experience. They are at the early stages of their career where they possess a moderate amount of teaching experience. It is a kind of transitional state since they have a mentor (like student teachers'), but they work alone with classes (like experienced teachers) and get more practice in self-monitoring by their apprenticeship (Glaser, 1996). However, this stage has many cognitive, affective, and behaviouristic advantages. Beginner teachers are considered as enthusiastic and energetic persons with "full of life". Many of them have new ideas, and they are highly motivated. They have up to date knowledge of their subject and of those pedagogical or psychological issues that they learnt in the university. They can also

## CHAPTER 2

observe things happening around them with fresh eyes (Corpuz et al., 2002: 16). At this stage, they have a huge enthusiasm for becoming a colleague of professionals, working with youngsters, having professional autonomy, and enjoying the variety of the profession (Huberman, 1994; Heafford & Jennison, 1998; Purcell et al., 2005; Goddard & O'Brien, 2003). In addition to the positive factors of this stage, several studies emphasized beginner teachers' main concerns as well. According to Staton and Hunt (1992) it is the stage of learning to teach in the practical sense. Feiman-Nemser claimed that their main task is to be changed "from student of teaching to teacher of student" (Feiman-Nemser, 2001, 1027).

### *The Main Challenges of New Teachers*

The early stage of the teaching career is a mixed state of enthusiasm and concern, "survival and discovery" (Huberman, 1994). Due to the abovementioned gap between theory of initial preparation courses and real practice, most novice teachers often experience "reality shock" or "practice shock". It means that they tend to get lost in the complex and uncertain situations of the classroom and the unexpected problems. They often feel that this job is much more difficult than they had expected before (Veenman, 1984; Huberman, 1989, 1994; Purcell et al., 2005; Achinstein, 2006; Flores & Day, 2006; Ulvick et al., 2009). The most critical period of new teachers is the first year, which is the phase of enthusiasm and struggle (see Bullough, 1989; Maynard & Furlong, 1995; Moir, 1999). Other researchers declared that the first three years have a crucial effect on novice teachers because during this time they decide that they leave or stay in the teaching profession; whether they "sink or swim" in the unexpected working conditions. Therefore studies relating to teacher life-cycle called this phase survival-oriented (see Lortie, 1972; Katz, 1972; Kagan, 1992; Maynard & Furlong, 1993; Moir, 1999; Feiman-Nemser, 2001). Several studies have asserted the aftermaths of these phenomena: the high range of new teachers who leave the profession after the first three years and cause significant shortage in more western countries (see e.g. Hunt & Carroll, 2003; Cockburn & Haydn, 2004; Purcell et al., 2005; OECD, 2005; DeAngelis & Presley, 2007; Chang, 2009; Keigher, 2010). The reasons for this high shortage can indicate both for the immediate school environment and educational policy makers what kind of changes should be done in order to help novice colleagues and keep them in the teaching job. That's why it is worth taking a look at beginner teachers' main concerns and challenges.

*Creating own identity and the socialization process.* Novice teachers are supposed to explore and fit in the "micro-political reality" of their school workplace (Bullough, 1989; Carter, 1999; Feiman-Nemser, 2003; Achinstein, 2006; Rizza, 2011). As Schön says (1987: 37): "When someone learns practice, he is initiated into the traditions of a community of practitioners and the practice world they inhabit. He learns their conventions, constraints, languages, and appreciative system, their repertoire of



exemplars, systematic knowledge and patterns of knowledge in action". However in addition to this, they have to construct their own professional identity which often differs from the previous identity (Flores & Day, 2006). They have to find new answers to the questions: Who am I as a teacher? Who should I be as a teacher? What are my current roles in this school?

The development of professional identity is a dynamically changing process influenced by personal identity, job features and work experiences (Beijaard et al., 2004; Sammons, 2007; MacBeath, 2012). One of the difficulties of novice teachers can include the tension between the fitting or the socialization process into the school culture and the rebuilding process of their own professional identity (see Staton & Hunt, 1992; Smethem, 2007; Pillen et al., 2013a, 2013b, 2013c).

*Perceptions of classroom events and discipline.* Classroom management and discipline are the leading difficulties novice teachers have to face (Veenman, 1984; Britt, 1997; Melnick & Meister, 2008). As former researches pointed out new teachers have much more need of development in student discipline and classroom management than their experienced colleagues (OECD, 2011c; Orgoványi-Gajdos, 2015). According to Cooper (2011), in spite of the educators' effort to deal with some components of class management (e.g. general communication, conflict management) it is usually not included in teacher education due to its complex, dynamic and situative features. Class management and discipline are massive part of teachers' practical knowledge and therefore it cannot be learned during theoretical courses.

Classroom management can be defined as a special combination of organizational ways, techniques and actions that teachers use to create a supportive and effective teaching-learning environment (Evertson & Weinstein, 2006; Balli, 2011). Since beginning teachers strongly focus on their own behaviour instead of their students' needs, they hardly see the relationship between class management, student behaviour, and lesson planning (Kagan, 1992; Tann, 1994). These findings correlate with novice-expert teacher researches too. They claimed that novices tend to plan for a short-term period and they follow the curriculum closely without paying attention to the student groups and needs or the learning environment. Due to the lack of their practical knowledge and less organized content knowledge, they perform with less flexibility and routine. They are not able to perceive the complexity of the classroom environment and its' components therefore they can recognize only the surface level of situations. That's why many of them insist on situation-specific and short-term solution methods. They also struggle in selecting among parallel and continuous classroom information (see Calderhead, 1984; Peterson & Comeaux, 1987; Borko & Livingstone, 1989; Brown & McIntyre, 1993; Westerman, 1991; Hogen & Rabinowitz, 2009; Tsui, 2009).

*Workload.* Demanding workload (even if the main part of the task is unexpected for a novice) was also considered as one of the key setback components of the job

## CHAPTER 2

satisfaction among beginners (see Cockburn & Haydn, 2004; Menter et al., 2002; Spear, Gould, & Lee, 2000; Goddard & O'Brien, 2003).

### *The Challenges of Work Environment at School*

*Induction of new teachers.* The previous paragraph outlined those challenges and concerns that cause difficulties for beginner teachers at the early stage of their profession. As Zeichner and Liston said "(...) no matter how good a teacher education programme is, at best, it can only prepare teachers to begin teaching" (1996: 6).

To resolve this contradiction research programmes related to the provision of professional support for beginner teachers became widespread in the 90's (Ballantyne, Hansford, & Packer, 1995; Lee & Wilkes, 1995; Martinez, 1994) and therefore more countries launched their induction/mentoring programmes for early career support. Induction programs usually have both formative and supportive sides normally organized by the management of the school. Such programs generally include mentoring support with lesson planning and other pedagogical advices as well as job shadowing allowing a deeper look into every aspect of the profession (Feiman-Nemser, 2003; OECD, 2009b; European Commission, 2013). Research proved that induction programmes can prevent early career exit in the teaching profession (Carter & Francis, 2001; Inman & Marlow, 2004). The European Commission (2010) stated that new teachers need personal support (for developing identity), social support (to fit into the professional community), and professional support (developing beginning teachers' competences) as well.

### *The Contribution of the Problem Solving Programme*

Since a considerable gap between theoretical knowledge (theory of teaching, knowledge of scientific field etc.) and practical knowledge has been emphasized by many experts, it is pivotal to give more support for teachers to carry out inquiries of their own pedagogical practice (Day, 1999). Therefore the program can be a useful tool for new teachers' induction by supporting the mentoring process of self-case reflection. It can promote "survival" skills, the method of exploration, and the bridging of different information. It helps to arrange the impressions of pedagogic situations into a system. It can also control the thinking process of novices relating to their practice step by step and give a frame to it. It can also help the members of the target group to move from short-term thinking to long-term thinking and to be able to develop their own strategies. All things considered, it supports novice teachers to change their initial teacher-centred approach into a more learner-centred approach.

## EXPERIENCED TEACHER STAGE

*Who Are Experienced Teachers?*

Experienced teachers have more years of working experience and they have a significant level of self-regulatory, content knowledge and problem solving skills. This depends on the stage they are at: whether it is the competent, proficient or the expert level (Glaser, 1987, 1996; Berliner, 1988). They get more confidence in classroom situations and they are more “professionally-oriented” (Tann, 1994: 101). They concerns mainly aim at pupil needs and teaching itself rather than concerns about self as a teacher (Fuller, 1974). They develop their own repertoire of schemata and also get more and more routine.

Scholarly inquiries into expert-novice teachers' behaviour and thinking process also showed that expert teachers have high level and well-integrated domain specific knowledge (pedagogical knowledge, subject matter knowledge, pedagogical content knowledge and curriculum knowledge) and they are also better problem solvers than their novice colleagues. They possess more sensitive cognition along with a more analytical and interpretive perception of particular situations. They also see classroom events in a system of the teaching-learning process and their view is more holistic. So they are engaged in long-term planning and they are more flexible than their novice colleagues (Calderhead, 1984; Housner & Griffey, 1985; Clark & Yinger, 1987; Carter & Doyle, 1987; Cushing, Sabers, & Berliner, 1991; Borko & Livingstone, 1989; Westerman, 1991; Brown & McIntyre, 1993; Hogen & Rabinowitz, 2009; Tsui, 2009; Orgoványi-Gajdos, 2015).

*The Main Challenges of Experienced Teachers*

*Functional fixedness.* When teachers get a considerable amount of teaching experience, they acquire and form more and more schematic thinking as well. Schemata are abstract knowledge structures that summarize information about many particular cases and the various relationships among them (Anderson, 1984; Leinhardt & Greeno, 1986). In other words it is “organized network of facts, concepts, generalizations, and experiences (...) constructed by teachers over the time as a result of their experiences” (Reagan et al., 2000: 24). Their thinking and behaviour also become more routine-directed in certain parts of the teaching process. In this sense, routine is a pattern of special actions, an automatized way of handling situations formed by teaching experiences. It guide teachers' behaviour in school-related problems (Yinger, 1979; Brown & McIntyre, 1993). Moreover, routine is one of the most important guides for teachers therefore they can give spontaneous and effective responses to both familiar and challenging situations

## CHAPTER 2

(Leinhardt & Greeno, 1986). On the other hand, too much routine can retrain teachers to observe things differently. In this sense, routine is similar to functional fixedness in the problem solving process. It is a cognitive bias preventing people from finding the recent use of a tool and discovering new ways of solutions (Eysenck & Keane, 2010).

As Schön said “(...) as a practice becomes more repetitive and routine, and as knowing in practice becomes increasingly tacit and spontaneous, the practitioner may miss important opportunities to think about what he is doing” (Schön, 1983: 61). It is important that teachers should be able to reframe and restructure their schemas and to change their routine if the problematic situation requires (Schön, 1983, 1987; Korthagen, 1992). According to Hammerness, adaptive experts as life-long learners can give up old routines and can transform former beliefs and practices (Hammerness et al., 2005).

*Continuous professional development.* Continuous Professional Development (CPD) is a process that comes from the expectation of the profession and the society as well as it also shows teachers’ own need for life-long learning.

Teachers’ life-cycle includes more challenge such as professional identity crisis or career frustration (Huberman, 1989; Burke, 1984). One of the experienced teachers’ main challenges is how to keep fresh and ready for the changes. To be a life-long learner in a conscious way it means to manage one’s own Continuous Professional Development. However this task is not an easy one therefore teachers need to learn how to direct their own learning process (Bush, 1999).

### *The Main Challenges for Institutions*

Professional development can be successful in such a school environment where teachers’ collegiality, openness, and trust are supported by appropriate leadership, networks, and collaborations. It is successful if it occurs during “on-the job learning” where there are enough opportunities and time for teachers to make continuous inquiries. In this context, teachers are supposed to be active learners and reflective practitioners who can identify their needs and interest and are able to plan their development (Lieberman, 1995; Day, 1997; Birman, Desimone, Garet, & Porter, 2000; King & Newmann, 2000; Villegas-Reimers, 2003; Kedzior & Fifield, 2004; Zepeda, 2012).

### *The Contribution of the Problem Solving Program*

“As professionals, teachers are expected to act as researchers and problem solvers, reflecting on their own practice and assuming greater responsibility for their own professional development” (OECD, 2005: 99).

#### TEACHERS' CHALLENGES AND PROFESSIONAL DEVELOPMENT

The programme helps experienced teachers to make inquiries about challenging situations. It can support teachers' continuous professional development by providing methods for restructuring former frames and schemas as well as giving up old routines. The tools of the programme can promote implementation, conceptual changes, and inventions.

## CHAPTER 3

# MAIN FEATURES OF THE TRAINING PROGRAMME FOR TEACHERS' PROFESSIONAL DEVELOPMENT ON PROBLEM SOLVING

### CONTEXT AND THE MAIN AIM OF THE PROGRAMME

The Training Programme for Teachers' Professional Development on Problem Solving is an interdisciplinary endeavour settled in a cross segment of three disciplines: educational science, psychology, and management science. Scientific inquiry on educational science provides the suitable theoretical background for teaching and teachers' competencies; teachers' thinking; teacher education and professional development. Results in cognitive psychology help to determine the theoretical side of the problem and the problem solving process itself. Management science concentrates on the development of the organization, which starts from the problem state. It therefore supports the practical part of the training programme as some of the thinking tools were adopted from this field.

The main aim of the programme is to support the development of teachers' problem solving skills at any stages of the profession. It can be used by teacher educators or the teachers themselves to raise awareness of those decisions which are related to a long-term problematic pedagogical situation. It supports the development of practical knowledge as it helps teachers to be aware of their own problem solving process without being lost in the details or staying on the surface of the problem. The programme supports reflective thinking, metacognition and self-directed learning by providing thinking frameworks and tools. It also enables teachers to analyse their challenges in a wider context. It aims to bridge the "theory – practice gap" in teachers' professional development by supporting knowledge transfer between educational theory and classroom practice.

### THE APPROACHES OF THE PROBLEM IN THE FIELD OF EDUCATION

In the field of education the meaning and usage of the expression of *problem* has different approaches according to the type of the problem, the inquiry methods, the perception of the situation, and the aim of the problem solving process. According to the differences, there are three main usages of the problem concept in the field of education.

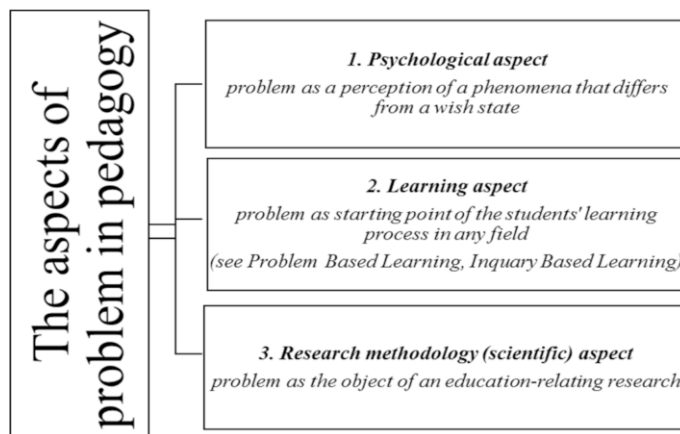


Figure 3.1. The aspect of problem in pedagogy

#### *Psychological Aspect of Problem*

The first approaches deals with those situations that one of a school-related person (this book focuses on the teachers) perceives as a problem (even if the original owner of the problem is not her/himself) and usually results in frustration due to the fact that the current situation differs from the expected situation. This approach focuses on the subject (who perceives?) and the psychological aspects (why he/she perceives it? how he/she perceives it? etc.) as well, so dominant factors in this problem situation include many subjective (affective) factors. The owners of the problem are motivated to solve the problem and to reduce psychic tension caused by the perception of the difference between the problem state and the goal state. The aim of the solution process is to handle problematic pedagogical situations and to neutralize the difference between the given and expected state. The main thinking process of the problem owners is basically reflection.

#### *Learning Aspect of Problem*

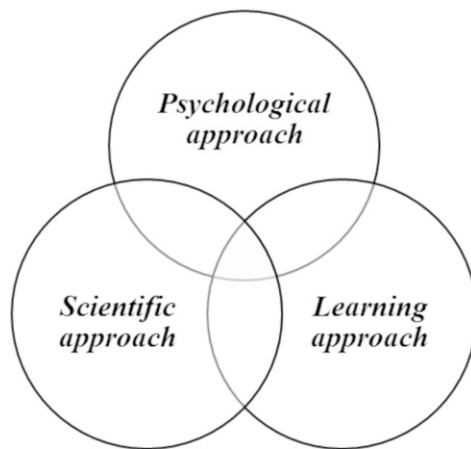
The second aspect concentrates on problem and problem solving as learning process. The literature called these methods inductive teaching-learning methods (see Problem Based Learning, Inquiry Based Learning etc.). In these approaches, the problem is a starting point in a student inquiry on a specific field. The tools used in the solving process are similar to those that the scientific field actually requires. From the students' point of view, the aim of the solution process is to answer the problem questions. The motivation behind the students' activities can include curiosity or wish for knowledge. From the teachers' point of view, the goal of these inductive methods is to develop different competencies (social, cognitive etc.),

promote a scientific view of inquiry, and self-directed learning, while increasing active participation in the learning process.

*Scientific Aspect of Problem*

The third usage of the problem is based on scholarly research in the field of education. The aim of these research is to explain how the teaching and learning process takes place in different contexts and to investigate all the topic that is connected to this process. The problem is therefore in this meaning an educational-related phenomena which is inquired by scientific methods and tools in order to confirm hypotheses created along the research problem.

Depending on which aspect of the problem is emphasized, or what approach is taken, and what the context and aim of the solving process is, different methods and tools are preferred.



*Figure 3.2. The connection of the three aspect of problem in field of education*

As [Figure 3.2](#) shows there are common area among each aspect of problem. The common point between learning and psychological meaning is the perception process. The difference between these two approaches can be the aim and the methods of problem solving. The aim of the learning aspect is the learning process itself starting form a problem situation of any filed. Since solving school-related problems are one of the teachers' pedagogical task they are often called pedagogical problem.

The common point between scientific and learning aspect are the inquiry methods. The different points are the object. While in the scientific meaning the object is a problem related to the area of education, in learning approach the object can be from any filed.



## CHAPTER 3

The common point between scientific and psychological meanings is the object as both of them deal with education-relating problems. However educational research focuses on any question that has educational aspect while problem from psychological approach usually stay around teaching-learning process.

The aim of the problem solving process at all meaning of educational problem can be difference therefore the inquiry methods may differ too. The scientific aspect of problem requires and emphasizes reliable and valid dates as well as results. The psychological aspect focuses on the person, who perceives a situation as a problem therefore the methods supports mainly the problem owners' reflective process although at a further steps it can also uses scientific methods.

The main problems of pedagogical situations from psychological aspect is often identified as interpersonal conflict that happen between two persons (usually teacher and student). However teachers often face with intrapersonal conflict or other word role conflict (Schwab & Iwanicki, 1982).

As far as interpersonal conflict concerned problem solving strategy is one of the most popular methods to reduce conflict in conflict management (see Kilmann & Thomas, 1977). Conflicts can truly cause problem situations, but not every problem is considered as a conflict. The concept of pedagogical problem has a wider meaning and not only can refer to conflict with parents, students, colleague, head-master but also it can refer to any teaching and teacher tasks (planning, evaluating etc.), or any phenomena in the teaching-learning process (managing groups, using different teaching-learning methods, new technology, handling diversity, managing the learning process of students with special needs, conflict between students, learning materials etc.) (Copeland et al., 1993). Therefore, in this program pedagogical problem can be understood as any kind of problem at any stages of the teaching process that is connected to the phenomena of classroom teaching and at least one involved person percept it as a problem. Pedagogical problems appear when the teaching-learning process, the world of school (regulations of the institution, national/local curricula), the students' personality (and their family background) and the teacher's task, competences and personalities come into contact. These challenging situations are identified by a person who became involved in the situation by perceiving a gap and tension between the given state and the expected situation. Therefore pedagogical problems are usually ill-structured, highly subjective, and situation-related phenomena.

### TEACHERS' KNOWLEDGE OF THEIR PRACTICE

Educational researchers recognize two types of knowledge: declarative (or conceptual) and procedural (practical) knowledge. The former includes cognitive processes relating to scientific knowledges and domain-specific theories. It is the knowledge of "to know what?". The latter refers to those cognitive activities that drive practice and therefore it has strong connection to skills and behavioural factors. It is the knowledge of "to know how?" (Winitzky & Kauchak, 1997).

However, there is still an ongoing debate among researchers about the dominance of these two types of knowledge in teaching and teacher education and about the gap between them (Day, 2015).

As far as *practical knowledge* is considered it is a practice-oriented, domain-specific conception and not organized in the meaning of formal knowledge (Munby, Russell, & Martin, 2001). Several experts noted that teachers rather use practical knowledge than theoretical knowledge concerning the interactive teaching-learning process. Teachers' practical knowledge "is firmly linked with teaching practice, includes all domains of professional insights relevant to teaching, and is organised in intertwined and interconnected ways related to teaching problems" (van Velzen et al., 2012: 24). Teachers develop their practical knowledge by the construction and the reconstruction of "teaching self" (Tang, 2003). This knowledge is tacit and implicit therefore it is hard to measure it with traditional testing methods (Eraut, 1994; Korthagen, 1993). It helps to deal with complexity and changing conditions in a particular practice (see: Guile & Young, 2003). It is claimed that practical knowledge closely correlates with problem solving on a specific field. According to Carter (1990): "Practical knowledge refers broadly to the knowledge teachers have of classroom situations and the practical dilemmas they face in carrying out purposeful action in these settings" (Carter, 1990: 299). Other experts claim that this knowledge should be expanded to a personal set of beliefs, values, motives, habits that guides teachers' action (see Elbaz, 1981; Feiman-Nemser & Floden, 1986; Connelly & Clandinin, 1988; Zanting et al., 2001). Elbaz (1981) tried to specify the structure ("rules, practical principles, image"), the content ("curriculum, subject matter, instruction, milieu, self"), and the orientation ("situational, theoretical, personal, social, experiential") of this procedural knowledge.

Cochran-Smith and Lytle (2001) make a distinction between "knowledge-in-practice", being the essential part of teachers' knowledge and teaching process as well as "knowledge-of-practice" being the outcome of the process.

As for teachers' practice, many researchers mention *case knowledge* (Doyle, 1990; Shulman, 1986) "that is constantly being formed and reformed with each day's experience" (Merseeth, 1994: 734). Calderhead (1991) also calls it *prototypical knowledge*, but he asserts that it is not like a set of recipes: it is rather a construction of knowledge that guides teachers' thinking about the possible reason, circumstances, and solution of a classroom situation.

Buitink (2009) speaks about *practical theory* that has instructional perspective (such as rules, student motivation, teaching method), interactional perspective (such as classroom management, questioning, giving feedback) and contextual perspective (such as organization, colleagues, timetable).

Bensman and Lilienfield (1973) consider the "craft of teaching" as an "occupational technique". From this starting point Brown and McIntyre (1993) go around the content and the importance of the so called *craft knowledge*. They claim that teachers obtain it by their own teaching practice. This type of teacher's practical thinking is also called *professional craft knowledge* by McIntyre as this

### CHAPTER 3

knowledge is a complex phenomenon that drives the different decisions during classroom teaching and personal considerations play a significant role behind it (Brown & McIntyre, 1993; Hagger & McIntyre, 2006). Kennedy (2002) outlines three types of knowledge that are relevant to teaching. In addition to “systematic knowledge” (that is more theoretical and abstract) and “prescriptive knowledge” (that is connected to institutional policies), she also speaks about craft knowledge “which is largely acquired through experience and which tends to be a-theoretical and idiosyncratic.” In her research Kennedy found that the origin of craft knowledge is a kind of experience which can be a real life situation and it can also have other sources like literatures, books or advice from colleagues. It helps teachers to avoid the same professional mistake. According to Tom, *craft person* (unlike novice teacher) is able to interpret classroom situation and has a wide variety of working strategies (Tom, 1984).

To sum up the findings, teacher’s practical knowledge:

- guides teachers’ actions and decisions
- is practice-oriented
- is domain-specific
- based on and can be improved by their real, school-related experiences
- is tacit and implicit
- is closely related to problem solving skill.

All things considered, teachers’ practical (or case, craft) knowledge has a significant role in all phases of the teaching-learning process. As it is known from novice-expert researches the level of practical knowledge and problem solving skill closely correlates. Experts of a certain field possess high level of problem solving skill and well-integrated domain-specific knowledge. For this reasons teacher expertizes perform better in the practical situations (see Carter, 1990; Tsui, 2009). It is also obvious according to the studies that practical knowledge is gained mainly by own experiences, so it should be developed and supported during teacher preparation and professional development by field-based training and appropriate tools of reflection. So reflective practice is one of the elemental possibilities that can provide a bridge between conceptual and procedural knowledge.

#### REFLECTING THINKING AND REFLECTIVE TEACHING

Research and policies on teachers’ professional development have emphasized the importance of reflecting teaching since the 80’s. The word “reflection” comes from the latin “re-flection” that means something is projected back by a surface. It also means a controlled thinking process by a purpose or outcome (Dewey, 1933; Moon, 2004). This meaning of the word became frequently used by Dewey (1933) who made a distinction between ‘routine action’ and ‘reflective action’. He claimed that reflective action is based on a real, problem-based situation an individual seeks to solve in a rational manner and it involves orientation (like open-mindedness,

responsibility) and skills (for ordering thought in observation, reasoning, and analysis) (Dewey, 1933, see also Reagan et al., 2000). The nature of reflection has been approached from different perspectives depending on which elements (its condition and circumstances, its process, its content, or its outcome) is highlighted (Sellars, 2014). Moon (2004) pointed out that different writers had emphasized varying components of reflection. Edwards and Brunton (1993) focused on the skill component, others (like Proctor, 1993; Smyth, 1989; Gore & Zeichner, 1991) concentrated on its critical side, while Vaughan (1990) and Bright (1996) considered it as a set of activities. Pollard et al. (2008) claimed that it is a key part of a self-development process.

Reflection is also considered as a link between practice and theory (Schön, 1983; Smyth, 1989; Calderhead, 1991; Barnett, 1994). Therefore, it has a strong connection to the experimental learning process (Gibbs, 1988; Kolb, 1984; Honey & Mumford, 1986; Eraut, 1994) and problem solving (Dewey, 1933; Calderhead, 1989; Adler, 1991; Kirby & Teddlie, 1989).

Postholm (2008) considers reflection as an action happening in the present, either reviewing a past event, and/or contemplating a potential change in the future. So the time focus of reflection can be past, present and future. Sometimes the aim of reflection can be an evaluation of a past event (Boud, Keogh, & Walker, 1985; Hatton & Smith, 1995). When reflection aims at interpreting or conceptualizing a phenomenon, it focuses on the present (see Race, 2002). When the reflection concentrates on solving a problem, the process refers to the future (see Dewey, 1933; Calderhead, 1989). These steps can be built on each other as it is seen in Figure 5. In this book, reflection is understood as teachers' cognitive process in long-term planning (see Sutcliffe & Whitfield, 1979) between two teaching actions. In this sense, reflection is also a cognitive tool that helps analysing former action, developing alternatives, making decision and planning for next action.

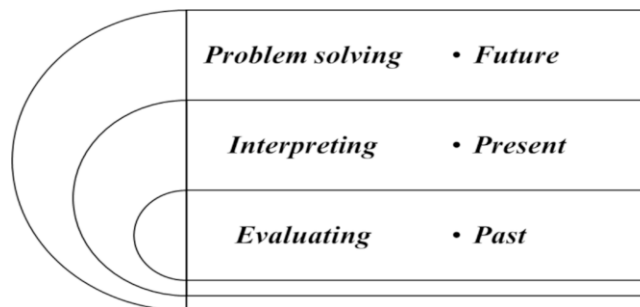


Figure 3.3. Reflective actions and time approaches

Reflective practice can be understood as a method for professionals to examine how they achieve the given results and develop the necessary components of the

process in accordance with the goal setting effort (Gibbs, 1988; Kolb, 1984). Due to the nature of teaching, reflection exists in different levels and different times (Vickery, 2013). It seems well-founded that teachers also behave as reflective practitioners (Schön, 1983, 1987). According to Cole and Knowles reflective practice in teaching is “(...) an ongoing process of examining and refining practice variously focused on the personal, pedagogical, curricular, intellectual, societal, and/or ethical contexts associated with professional work” (Cole & Knowles 2000: 8).

In order to be able to solve pedagogical problems, teachers need to develop their professional practical knowledge by conscious and continuous reflection. Reflective teaching is therefore a way and also a tool for developing practical knowledge that leads to efficient problem solving of any pedagogical challenges. As it was explained previously, in a broader sense any unsolved aspect of the teaching process can be considered as a pedagogical problem. “Reflection results from an actual or potential occurrence of a problem, in any case, something related to the teachers’ practice. In this context practice is meant to be the broad picture of teaching as a profession. It includes instructing, understanding, planning, managing, building and maintaining professional relationships, evaluating the philosophical underpinnings of one’s professional actions, and more” (Copeland et al., 1993: 350).

To sum up teachers’ problem solving is seen as a conscious and continuous reflective process occurring mainly in the pre or post active teaching phase rather than the more spontaneous and schematic interactive phase (see Figure 1.1). To be a successful problem solver, it is necessary that teachers view themselves as researchers of their own practice. According to this approach, reflective teaching can also be a special state of mind (“to be reflective”) and also a habitual phenomenon (Vaughn, 1990; Van Manen, 1991).

Since reflection is one of the most important elements of teachers’ learning process, it is a significant part of their professional development as well. Therefore, several attempts were made to incorporate reflective practice into teacher education programs (see Richert, 1990; Russell, 1997; Tom, 1985; Valli, 1993). It was Zeichner and Liston (1987) who developed a curriculum of teacher education, which focused on reflective teaching. According to Zeichner and Liston (1996), reflective teachers are sensible to the cultural context of their educational institution and they take part in school development. They also observe and solve classroom problems, think of and over their values related to teaching and tend to have responsibility for their professional development.

“Those writing about reflection in teaching and teacher education have drawn variously upon these theorists, emphasising to differing extents features as problem-setting and problem-solving, the employment of particular knowledge bases, analytical skills, the attitudes facilitating a reflective approach, levels of self-awareness, self-determination, the examination of values and moral principles (...)” (Calderhead, 1989: 44).

## THINKING FRAMEWORKS AND TOOLS

Teaching is a highly context-dependent activity where many circumstances influence the process itself. However, there are two approaches to the nature of the pedagogical situations (see [Table 3.1](#)). In the first approach there are many similarities in the situations teachers are supposed to face in school. Therefore there are several accounts which provide methods and tips for dealing with certain situations (titles such as: “Survival guide...”, “The most effective way of...”). The theoretical background of these books is based on the existence of situational knowledge which “is a knowledge about situations as they typically appear in a particular domain” (De Jong & Ferguson-Hessler, 1996: 107). This kind of knowledge is definitely situation-specific and context-dependent (Merseeth, 1996). As far as teaching is concerned, the so-called classroom knowledge emphasizes the common experiences of a classroom event and it is based on the same demands and schema-theoretic approach of these episodes (Carter & Doyle, 1987; Carter, 1990). This type of knowledge can be operated usefully in the same context, with the same situational features. This cognitive process is therefore mobilized by surface-knowledge based on reproduction and experiments of trial and error (Glaser, 1991). So situational knowledge is based on the fact that common situations have common solution.

These hints can be useful to handle symptoms of the school phenomenon. However, in many cases, dealing with symptoms is not enough and teachers need to go deeper by reasoning, analysing and seeking the appropriate solution. Generating new solutions, tips and aids can be a good starting point. But teaching can never be a routine (even if there are many routinized elements in it). “Students do not learn at the same pace or in the same ways (...) teachers must constantly cope with changing situations, learning needs, challenges, questions, and dilemmas” (Hammernes et al., 2005: 377–378). What works in one situation may not work in the other. School cases are situated ones as they are “... embedded in context of application and emotion, of place and time” (Shulman, 1992: 23). Therefore, the other approach claims that despite similarities appearing on the surface, every situation is unique and depends on several internal (teacher’s knowledges, skills, dispositions, beliefs, actual mood) and external (context, involved persons of the situation etc.) factors (Hirst, 1996). It is the practical knowledge that help one to handle unique situation in a specific field. This view is based on reflective practice that counts on the personal and situational factors. Practical knowledge (which is context-dependent one) can be developed by content-independent thinking frames.

While normative theories of education prefer to prescribe the exact way of the teaching-learning process, those who engaged in value pluralism of education prefer to think in content independent methods, tools and cognitive frameworks.

To be able to create an appropriate strategy for problematic situations teachers need to use deep-level knowledge, which is associated with problem representation,

*Table 3.1. The differences between adopting or developing solutions*

<i>Aspect</i>	<i>Tips</i>	<i>Thinking tools</i>
<i>Assumption</i>	Based on the similarities of the situations: common solution for common situation	Based on the differences of the situation: individual solutions for unique situations
<i>Context</i>	Content-dependent tips	Content-independent thinking frame
<i>Main factors</i>	Common factor between similar situations	Personal factors from both teacher and student side
<i>Knowledge</i>	Surface-level knowledge	Deep-level knowledge
<i>Type of knowledge</i>	Situative knowledge	Practical knowledge
<i>Content of knowledge</i>	Domain-specific knowledge	General knowledge
<i>Type of activity</i>	Reproductive	Productive
<i>Focus of the process</i>	Focused on the aim	Focused on the reason
<i>Decision type</i>	Well used for immediate/ short-term decision	Well used for long-term decision
<i>View of pedagogy</i>	Normative theories of education	Value pluralism of education

analysis, decision making and evaluation (Snow, 1989; Glaser, 1991). Pedagogical strategy “is an interpretation process of a real school-based situation where teachers construct a solution, based on their personal attitude, knowledge, ability and former experiences for a certain aim by taking relevant circumstances and conditions into consideration” (Orgoványi-Gajdos, 2011: 59). The Training Programme presents practical tools and techniques in order to give teachers conceptual frameworks (see [Table 3.2](#)) for building own pedagogical strategies in problematic school situations.

#### SELF-CASE REFLECTION

##### *Reflecting on One’s Own Professional Experiences*

*Self-Case Reflection* is a special metacognitive process aiming to solve individual pedagogical problems supported by thinking tools and techniques. During the training process, participants deal with their own pedagogical cases they had brought from their real school experiences. The course (outlined in this book) gives them the suitable amount of support to find solutions to their challenges by providing different views, techniques, methods, activities and a trainer: they therefore take part in a guided Self-Case Reflection process.

MAIN FEATURES OF THE TRAINING PROGRAMME

*Table 3.2. Thinking tools used by the training program for teachers' professional development on problem solving*

<i>Steps of the problem solving process</i>	<i>Thinking tools</i>
<i>Problem and goal setting</i>	Draw it! Who has the problem? Bothering aspects and defining the aim Framing by metaphor
<i>Collecting information</i>	General sources of information Objective and subjective information Unsent letter Needs and anxieties of involved persons Fishbone diagram Retelling the story from their side
<i>Developing alternatives</i>	General sources of solutions Convert the disadvantages into advantages What would he/she say? What would you suggest? Concept Fan SCAMPER Dictionary
<i>Decision making</i>	Two dimensional chart Future Wheel Force-field analysis
<i>Acting</i>	Starbursting Evaluation steps

Depending to the psychological, learning (pedagogical), and scientific approaches of a school-related problem (see [Figure 3.1](#)) different aims and therefore different methods are required.

In this respect, Self-Case Reflection seems similar to such inductive teaching-learning methods as Case-based Learning, Inquiry Based-Learning, and Problem-Based Learning (see Prince & Felder, 2006).



Self-Case Reflection has a strong relation to case-based learning (or to such expressions as case-based method, case-based pedagogy, and case-based instruction) because participants deal with real cases during the course. However, in case method, cases are usually created or selected for analysis and discussion by the educators specifically for the learning process. In this teaching-learning method, cases are “richly detailed, contextualized, narrative accounts” (Prince & Felder, 2007) and a “multidimensional representation” of reality (Merseth, 1996: 726).

As a learning tool, case-method has been used in teacher education from the 80's mainly for developing prospective teachers' practical knowledge (eg. Carter, 1989; Doyle, 1990; Kleinfeld, 1988; Richardson, 1991; Shulman, 1992; Harrington, 1995; Levin, 1995). The aim of the method is to present “problematic situations that require analysis, problem solving, decision making, and action definition” (Merseth, 1996: 728). It can also provide an environment where participants “not only see alternative conceptions of teaching but also build their own understandings as they interact with these cases and their colleagues” (Merseth, 1996: 734). In addition, it is also “conveying contextual knowledge to students to provide an understanding of the situatedness of evidence, the interrelationship between theoretical and practical knowledge, and the moral nature of teaching” (Harrington, 1995: 203; see also Harrington, 1994; Harrington & Garrison, 1992). All in all, case method is a ‘from practice to theory’ method that provides a deeper understanding of the specific situation including multicultural perspectives (Noordhoff & Kleinfeld, 1991), theoretical perspectives (Shulman, 1992; Wasserman, 1993); while developing reflective thinking (Shulman, 1991; Shulman et al., 1990; Merseth, 1996), pedagogical reasoning (Harrington, 1995), critical analysis, problem solving, strategic thinking (Greenwood & Parkay, 1989; Silverman et al., 1992), and case type of knowledge (Doyle, 1986; Shulman, 1986). According to Hammernes' (2002) study case-method can foster the development of student teachers' cognitive process from novice stage to a more sophisticated (expert) phase relating teaching and learning.

There are so many similarities between case-based learning and Self-Case Reflection. The most important differences that during Self-Case Reflection, the participants work with their own cases taken from their own real-world experiences in order to find answers for their own pedagogical challenges.

Other studies also pointed out that the use of cases in the teaching-learning process has influential motivational factors as well (Shulman, 1992). It is vital in Self-Case Reflection where learners' own cases are in the focus of the attention.

Furthermore, participants tend to analyse those cases that have a focal problem therefore, it seems to be similar to Inquiry Based-Learning (IBL) and Problem-Based Learning (PBL). Many experts touched these issues and the meaning of these inductive teaching-learning methods varies in their accounts. In my view, IBL is considered as a scientific research in a classroom environment. This teaching-learning method is popular in the field of natural science where the object of the inquiry is the physical world (Spronken-Smith et al., 2007). In PBL, the actual curriculum is organized around a related ill-defined, ill-structured and real-world

problem. Learners explore different sources and build their own understanding by solving the given problem. The thinking process is organized by the educator who provides enough instruction and related content materials for the learners working in collaboration (Newman, 2005; Savery, 2006; Blessinger et al., 2015). That is why Self-Case Reflection differs from the above mentioned learning and teaching method, while IBL and PBL focus on the learning and observational process itself by investigating the physical or scientific world. The attention in Self-Case Reflection is drawn on the individual's perception of the challenging pedagogical situation.

Self-Case Reflection can be similar to some research methods as well. As a matter of fact, case-study is rather an observational research method aiming to analyse a unique, special, or interesting story by an uninvolved, third-person (Shulman, 1992; Yin, 2013). Action research focuses on the experimental process of a chosen possibility attempting to improve the condition and practice of a specific situation (Lewin, 1946; O'Brien, 1998).

All things considered, the main differences in inductive teaching-learning methods, research methods and Self-Case Reflection are the following: the first focuses on the learning process itself, the second concentrates on the result of a scientific observation, while the last one focuses on the reflective process as such.

In Self-Case Reflection learners are supposed to have a huge responsibility for their own developmental process. They have possibilities to go deeper in the chosen situation by analysing the facts and understanding the core of the problem. They can also step out from their problem when they are synthesizing and making new solutions. They can make a connection between the theoretical knowledge of education science and the practical knowledge of pedagogy. They tend to consider the pedagogical, psychological, social, and contextual aspect of the case more effectively.

Facilitating Self-Case Reflection, leaders have huge responsibility for the participants' learning process. Their role is to explain and clarify the process and the techniques, to help the participants to identify, analyse, and solve their problem by using particular techniques. They are also supposed to accompany and (if needed) to guide learners' cognitive process, to monitor and direct the interactions, and to keep the time (Shulman, 1992; Merseth, 1996; Morine-Dershimer, 1993). Teacher educators being in this role also act like "cognitive coaches" who help to recover participants' cognitive maps related to thinking about their practice (Costa & Garmston, 1992; Garmston et al., 1993). Teacher educators are supposed to be familiar with those pedagogical dilemmas participants may come up with while they solve their own challenges.

Educators can also decide whether they want to focus only on one type of teacher challenge and to build a course around only this topic (e. g. teacher – parent relationship, student behaviour, working with colleague etc.). I recommend this technique for in-service training where teachers have more pedagogical experience and tasks than novices therefore everybody can come up with an individual case from the highlighted pedagogical field. Further pieces of advice for facilitators include the

## CHAPTER 3

following: if it is a one – or two-day course it is better if the participants deal with one case during the training. If the training process is a longer period, participants can bring in different cases for every particular block.

### CONSTRUCTIVISM AND THE ROLE OF TEACHER EDUCATORS

The program outlined above is actually based on constructivism. Constructivism is an epistemology, a theory of knowledge and basically it gives an explanation for the nature of learning that has had a huge effect on pedagogy as well. According to this theory everybody has different representations of reality therefore knowledge is a mental construction by the continuous personal perception of the reality that may lead to conceptual changes (Keiny, 1994; Glaserfeld, 1989). More specifically, “(...) meaning is constructed in our minds as we interact with the physical, social, and mental worlds we inhabit, and that we make sense of our experiences by building and adjusting such internal knowledge structures that collect and organize our perceptions of and reflections on reality” (Swan, 2005: 2). In a broad sense, every learning process is a construction and strongly connected to any kind of experience no matter where and how it takes place. However, the latest studies in constructivist pedagogy claim that a new approach of teaching and teacher role – that differs from the traditional mass-education and transmission-oriented view – can provide such an environment of learning process where there is a possibility of a greater variety and quantity of representations, organization and use of knowledge. In this learning process, participants become active and adaptive learners where they construct their own conceptual structures by observation and reflection (Glaserfeld, 1989; Swan, 2005; Reagan et al., 2000; Dadds, 2001; Richardson, 2003).

The presented programme also supports this process where the role of the teacher educator includes the following:

- to provide active participation in the developmental process
- to build the learning process on the participants’ real-life experiences
- to deal with former knowledge of participants
- to accompany the teachers’ thinking process (from observing and analysing to making relevant strategies)
- to promote learners’ mental construction by showing them useful techniques for the thinking process
- to let participants create new understandings
- to be a facilitator, a moderator, or a “reflective instructor”
- to create active, challenging, authentic and multidisciplinary learning environments

### PAIR PEER COACHING

The recommended method for participants in Self-case reflection is pair peer coaching, which takes place with the help of a facilitator. “Peer coaching is a

## MAIN FEATURES OF THE TRAINING PROGRAMME

confidential process through which two or more professional colleagues work together to reflect on current practices; expand, refine, and build new skills; share ideas; teach one another; conduct classroom research; or solve problems in the workplace” (Robins, 1991: 9). During the problem solving process, participants work together in a pair work. One of them is the insider who possesses the problem and the other is the outsider who assists his or her pair’s thinking process by asking questions and giving new aspects for the current issue. After a defining session they can change roles.

## OUTCOMES OF THE PROGRAMME

### *Development of Competencies*

At the end of the programme, participants will know and be able to use thinking frames, tools and techniques on all levels of the problem solving process. They will be able to transfer their theoretical knowledge into practice and to move from reproductive thinking to a more productive and adaptive one. They will also be able to see their challenges as part of a system and they will consciously follow their cognitive process from perception to the solution of their own individual problems. At the stage of problem perception, participants will be able to define the problem itself, they will set the goal and recognize their own role in it. At the stage of information gathering, they will be able to collect, divide, analyse and categorize subject (opinion, impression, feelings) and object (facts) information of the given situation and they will be able to see and make questions about the missing elements. They will be also able to find the possible sources of the problem by discovering the relationship between cause and effect. At the stage of solution finding, they will be able to generate alternatives by collecting existing solutions (methods, partnership with professionals) and by developing new ways with creative thinking techniques. At the stage of decision making, they will be able to evaluate the alternatives and choose between them taking the different factors and outcomes into consideration. Therefore, they get acquainted with creative and critical thinking as well and they will be able to justify their decision. At the stage of acting, they will be able to make plans and evaluate the result of the process. They will also be encouraged to rethink their beliefs, values and dispositions concerning their tasks and roles as a teacher. The presented program places the improvement of problem solving skills in a wider context as it gives some ideas of activities that can ensure professional development in a problematic field.

### *Creating a Portfolio*

During the course, it is suggested that participants should set up a working portfolio in which they can collect the methods and tools they had learnt. They can also follow their thinking process, reflect and rethink their earlier activities and thoughts.

### CHAPTER 3

Every block contains a couple of activities for further thinking and writing helping participants to go deeper in the topic or to examine it from another perspective.

#### THE STRUCTURE OF THE TRAINING PROGRAMME

The course material is divided into eleven blocks. Every block includes the main aim and the theoretical aspect of the given section and the activities. These activities are divided into three segments. The first section covers introductory activities that help participants to get acquainted with the topic of the block. Furthermore, it aims at defining important terms and expressions as well. The second section is a vital part of the blocks considered. It contains thinking tools and techniques related to the particular block. The role of the third section is to gain evaluation and reflection (see more about this division: Temple et al., 1996). Finally, at the end of the block, there are activities for further reflection. It can be used by participants to rethink some of the key aims of the block or by educators to expand group activities. The training programme is an open curriculum that means educators can use it flexibly depending on the type and the size of the group.

## CHAPTER 4

# **TRAINING PROGRAMME FOR TEACHERS’ PROFESSIONAL DEVELOPMENT ON PROBLEM SOLVING**

### *Course Activities and Materials*

#### 1ST BLOCK: WELCOME AND INTRODUCTION

##### *Aim of the block*

This is an introductory section where the facilitator and the participants meet each other. The crucial task here is to make group members know each other, to introduce the goal, content and structure of the course. Moreover, understanding of one’s self and job motivation are important concerns as well. Participants can also define some vital personal characteristics and face those beneficial or unbeneficial factors affecting their job-satisfaction.

##### *Theoretical background*

Several studies emphasized those crucial and positive factors that influence the decisions of preservice and experienced teachers when they consider their profession as a job (Cockburn & Haydn, 2004; Spear, Gould, & Lee, 2000; Goddard & O’Brien, 2003; Purcell et al., 2005; Hobson et al., 2007; Melnick & Meister, 2008). Therefore it is very useful for (future) professionals if the educator lets them to be conscious about those factors that lead them to or prevent them from making a choice or carrying on this job.

##### *Activities*

#### WARMING UP ACTIVITIES

##### *1. Aim of the course*

The educator introduces him/herself and the main features of the course are also outlined during this phase. The trainer gives some information about the aim, structure and methods of the course.

## CHAPTER 4

### 2. *Introducing the course and ourselves*

The educator lays twice as many pictures (with different topics) on a table than the group size. The group members are asked to choose a picture that expresses their personality as a whole including their values, dispositions, and professional beliefs. When all members have a picture, they choose a pair and give him or her some details about their self-image with the help of the chosen picture. After pair work, every participant shares what information they got about the other person. The task ends when everybody introduces his or her pair with the help of the picture.

### 3. *Expectations and concerns*

The trainer hangs a large sheet on the wall with two category brackets: expectations and concerns (see [Figure 4.1.1](#)). The participants get some post-it notes and draw their most important expectations and concerns relating to the course onto it one by one. Then, they place their post-it notes onto the large sheet. The educator looks through the notes and can add some personal comments.

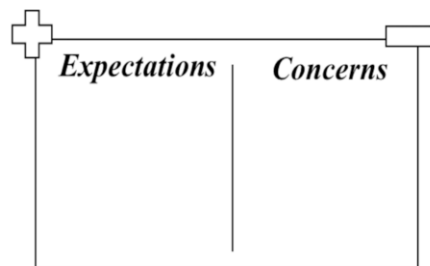


Figure 4.1.1. Table of expectations and concerns

## MAIN EXERCISES

### 1. *Get one – give one (character market)*

The aim of the task is to let participants pick the two most important characteristic features of a good teacher. Each member draws two papers with a word on it from a bag (see the list in [Table 4.1.1](#)). They can exchange their words like in a market: when somebody gets a new word she or he has to give one in return until everybody possesses those two expressions that symbolize for them the most important characters of a teacher. When everybody is satisfied with the result, they can share their experience about the task and discuss the chosen words.

Table 4.1.1. Words for character market game

Accountable	Passionate	Empathetic	Evolving	Kind
Dedicated	Generous	Inspirational	Dynamic	Helpful
Motivated	Patient	Structured	Flexible	Reliable
Organized	Resourceful	Encouraging	Conscious	Communicative
Passionate	Creative	Direct	Clever	Self-confident
Enthusiastic	Humorous	Practical	Skilful	Broad-minded
Lively	Supportive	Cooperative	Harmonic	Cheerful
Constructive	Positive	Fair-minded	Consistent	Deep

2. Let's rank it!

The agenda (Figure 4.1.2) shows the advantages (by satisfiers) and the disadvantages (by dissatisfiers) of the teaching job. Firstly, every participant should rank individually what they see as a beneficial and non-beneficial force in their jobs. Then, participants are divided by the trainer into two groups. One group examines the advantages while the other one focuses on disadvantages. After that the groups can share their experiences and opinions about these topics with the help of the trainer. It is also well-worth for participants to think over the role of beneficial and

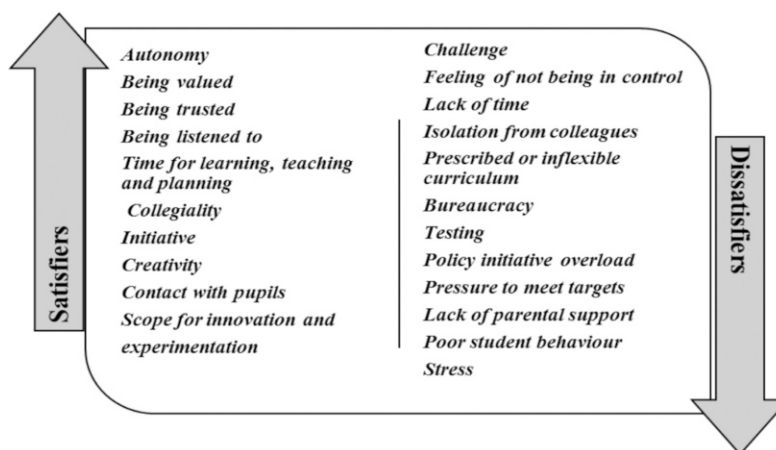


Figure 4.1.2. Agenda of advantages and disadvantages of the teaching profession (Source: MacBeath, 2012: 13)



## CHAPTER 4

non-beneficial forces in their profession. Furthermore, seeing how positive factors can have a beneficial effect while facing difficulties on its own.

### *Useful Questions:*

Do you agree with the agenda?

Is there any factor that would be necessary to put in the agenda?

### *3. Palm drawing*

This exercise summarises the activities of the given block. With the help of this task, group members can think over some personal and professional aims and the connection between them. Every member draws their palm on a paper. Each finger symbolizes something. Having finished filling the picture of palm participants can share the outcome of the activity.

*Table 4.1.2. Palm activity*

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Thumb: one word that symbolizes me
Index finger: my personal aim
Middle finger: my professional aim
Ringfinger: driving forces related to the teaching profession
Little finger: restraining forces related to the teaching profession

---

## EVALUATION

### *1. One word*

The members are asked to tell one word or one expression that describes the block they have just covered.

## ACTIVITIES FOR FURTHER REFLECTION

### *1. Setting up a portfolio*

Participants can start their own portfolio to collect all those techniques, methods and theories that may be useful during their profession. They are also expected to follow how the current case can develop from the initial point and lead to a solution. To be able to do this, they can take some notes about the outcome of the course activities. Participants can learn a lot by systematically reviewing the portfolio.

### *2. Me and my profession*

It is useful if participants think about the following question: What is the connection between my personal characteristic features and my profession? How do other

TRAINING PROGRAMME FOR TEACHERS' PROFESSIONAL DEVELOPMENT

people (relatives, students, friends, colleagues) see this connection? Would they choose the same words as me if they talked about me? Participants can write their findings in the portfolio as well.

2ND BLOCK: TEACHER ROLES, COMPETENCIES  
AND DEVELOPMENTAL NEEDS

*Aim of the block*

This block enables the participants to define the main roles of the teaching profession and to reflect on the complexity of these roles. It also aims to identify their competencies and developmental needs.

*Theoretical background*

The complex impact of the role of the teacher and of teaching on the multidimensional nature of the profession has received attention from educational policy makers (see European Commission, 2011). Different aspects of teachers' professional identity require a thorough analysis, which can reveal what it means to think (Kleinfeld, 1988), to know (Darling-Hammond & Bransford, 2005), to feel (Hagger & McIntyre, 2006; Feiman-Nemser, 2008) and to act (Kennedy, 1999) as a teacher. Teachers need to be responsive to the ever-changing situations and react to the upcoming challenges in order to be a life-long learner (Day, 1999), or in other words: to be adaptive experts (Hammerness et al., 2005) and change agents (Hill, 1971; Fullan, 1993). This kind of self-education contributes to the fact that teachers need to be able to function as a researcher in order to examine their own practice and to be able to solve pedagogical problems (Klinghammer, 1986; Cochran-Smith & Lytle, 1990, 1993; MacLean & Mohr, 1999; Day, 1999; Regan et al., 2000).

Teachers as leaders are supposed to have a multi-faceted (Fessler, 1990) thinking because they need to concentrate on the structure of the school at different levels, roles and relationships. Constructivism and the different types of inductive teaching-learning methods drew the attention to a new leading style when teachers become tutors or facilitators of students' cognitive learning processes (Neville, 1999; Reagan et al., 2000; Richardson, 2003).

To answer the challenges of the complexity of the teacher's role and the classroom situation, teachers need to face their professional weaknesses and strengths. Most pedagogical problems come from an area teachers do not really excel in. That's why teachers systematically need to identify those areas that need to be developed in order to reduce the source of these problems.

The results of the international OECD survey show that teachers wish most development on the area of teaching students with special needs. It is also indicated as the biggest challenge in the profession (OECD, 2009).

The individual professional development plan is viewed as a useful tool to monitor the growth of competences on a problematic field therefore many European countries require it (Zepeda, 2012; European Commission, Eurydice, 2013).

It usually includes the aims: those skills, knowledge or attitudes that the teacher wishes to enhance. It needs to determine those strategies, activities, materials, and other sources that provide the appropriate ways to the enhancement. It is very important that the plan has a time management segment along with exact indicators of success (Zepeda, 2012).

*Activities*

WARM UP ACTIVITIES

1. *Pyramid*

The exercise helps the participants identify their main aims concerning the learning-teaching process and the importance of it.

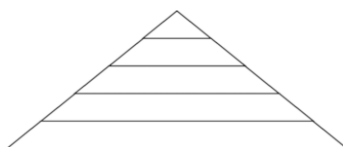
The trainer passes a sheet of [Table 4.2.1](#) to each member. They choose five important words that symbolize their learning-teaching aims and they rank them in a pyramid form ([Figure 4.2.1](#)). After filling their own pyramid, the participants can have a professional debate about their decisions.

*Useful questions for discussion:*

- What do you consider the meaning of the chosen words?
- What is at the bottom and at the top of your aim pyramid?
- How did you pick the words?
- Was the exercise difficult? Why?

*Table 4.2.1. Words for Pyramid activity*

personality	knowledge	integration	creativity	thinking	attitude
society	erudition	individual	craft	culture	subject
motivation	norms	group	values	differentiation	developing
content	relationships	outcomes	assessment	curriculum	tradition
labour	model	nurturing	talented	learning	My word:
market			student	environment	



*Figure 4.2.1. Sample for Pyramid activity*

## CHAPTER 4

### MAIN EXERCISES

#### 1. *Teacher as ...*

The task helps to identify the nature of teacher roles in different contexts and relationships. Participants receive a photocopy of [Table 4.2.2](#) (see also Appendix, No. 1) and they have to interpret the statements individually or in small groups. With the help of the educator, who functions as a facilitator, group members discuss their interpretations. They can also decide which one is the most important and the least important for them as a teacher (Source of statements: European Commission, 2013: 13, 53).

#### *Useful questions for discussion:*

What is the most/least popular aspect of the teacher role?

What was the most difficult to interpret?

Which one can you identify with the most?

*Table 4.2.2. Source material for Teacher as ... activity*

---

Teacher as ...
... a lifelong learner: _____
... a subject matter specialist: _____
... a member of a school team: _____
... a social agent: _____
... a member of the educational community: _____
... an organizer: _____
... a classroom actor: _____
... a tutor: _____
... culture participant: _____
... researcher: _____
... leader: _____
... facilitator: _____

---

#### 2. *Strong and missing competences*

Every group member picks one success and one failure related to their teaching career. After giving a short description of the situations, they consider the background of their success and their failure. They consider competencies they possess and which support the resolution of the problematic situation. They also think over their missing competences which can lead to the presented failure ([Figure 4.2.2](#) see also Appendix, No. 2). The importance of this exercise is that participants become

aware of those competences (their strength) that they can rely on. On the contrary, problems always derive from the missing competencies (weaknesses) so participants should be conscious about them and they need to find a way how they can be improved.

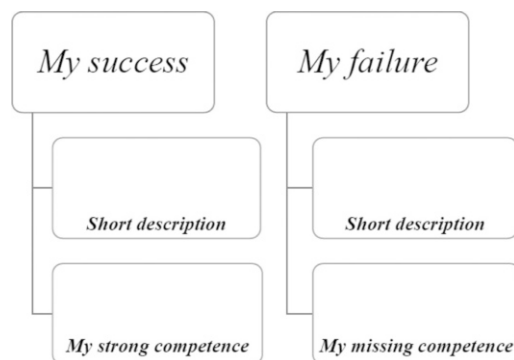


Figure 4.2.2. Sample picture for Strong and missing activity

*Useful question for discussions:*

- What are the main sources of my successful situations?
- What are the main sources of my problem situations?
- What do I need to improve in order to prevent problem situations?
- What are my strengths regarding my profession and can these provide substantial help in problem situations?

### 3. My development needs

Following the previous exercise, group members can rank their expertise as far as the main teaching skills are concerned. The facilitator passes a sheet (Table 4.2.3 see also in Appendix, No. 3) to each participant. They rank their development needs ranging from the best (1) to the least successful (11) competence according to the field on which they are the most and the least confident. After filling the box, they can discuss it with the help of the facilitator. Sources of pedagogical problems can be related to those fields participants are less confident about.

### 4. Teachers' development needs around the world

Participants can take a look at a chart (Figure 4.2.3 see also Appendix, No. 4) which is an international figure of OECD/TALIS from 2007–08 (for detailed dates see OECD, 2009:86). They can discuss it thoroughly by comparing their own rank (see in exercise 3). It is interesting to see how group members see teachers' need of development.

Table 4.2.3. Source material for my development needs activity

Competence	Rank
Content and performance standards	
Student assessment practices	
Classroom management	
Subject field	
ICT teaching skills	
Teaching special learning needs students	
Student discipline and behaviour problems	
School management and administration	
Teaching in a multicultural setting	
Student counselling	
Teaching in a multicultural setting	
Instructional practices	

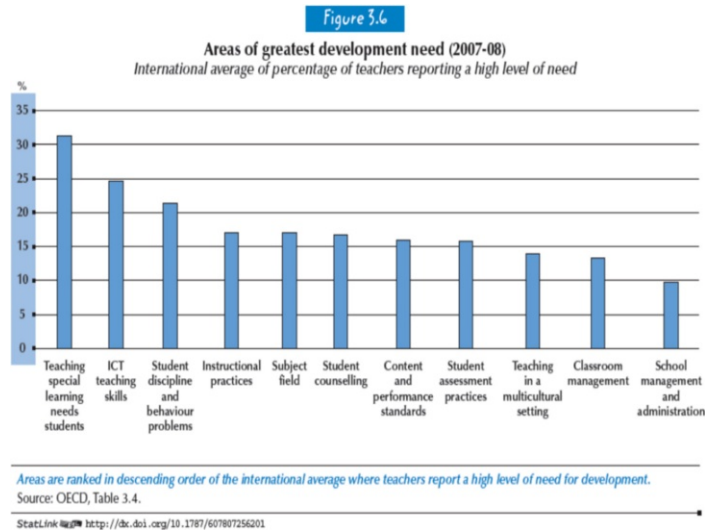


Figure 4.2.3. Teachers' development needs  
(Source: OECD, 2009: 60)

Useful questions for discussion:

- What do you think about this figure?
- Do you experience the same pattern in your country?
- Does it have the same pattern as in your profile?

EVALUATION

*1. One word*

Every participant writes down one word relating to the block. Then, they can discuss them.

ACTIVITIES FOR FURTHER REFLECTION

*1. Plan for own professional development*

Participants can be encouraged to create their own individual development plan for a special field according to their professional challenges and needs (see Main exercise 1 and 2). It can be expanded later by activities presented in the 8th Block (Table 4.8.1).

*Useful questions:*

In what field do you want to develop and why?

How can you work out your development (creating portfolio, timetable etc.)?

What do you need for this development (time, persons, activities, money etc.)?

What will be the indicators of your development?



3RD BLOCK: WHAT DOES PROBLEM MEAN?  
(PROBLEM, CHALLENGE, TASK)

*Aim of the block*

This block aims to analyse problems in a wider and a narrower context concentrating on the pedagogical considerations. It enables the participants to explain their attitude to problematic situations and pedagogical challenges. The block also attempts to compare the meaning of challenge, task and problem.

*Theoretical background*

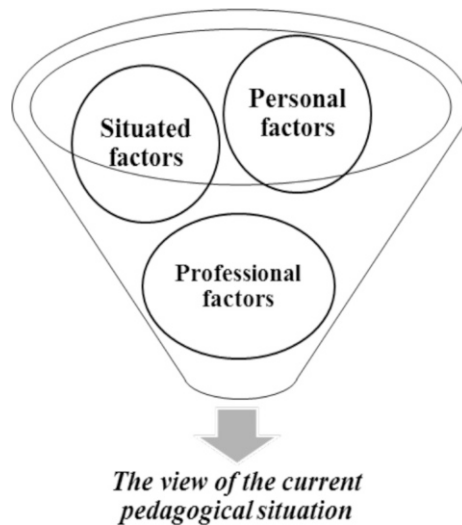
According to the learning zone model (see Luckner & Nadler, 1997; Brown, 2008) a situation can be familiar (comfort zone), new and maybe stressful but controlled (learning zone), or new, stressful and uncontrolled (panic zone). Situations in the comfort zone are mainly routines or simple tasks without specific effort. Challenging or problematic situations with significant effort are located in the learning zone can be kept under emotional control. Problematic situations that result in uncontrolled stressful reaction and require too much effort from the involved person are in the panic zone. This model is based on Yerkes and Dodson law (1908). Problems should be kept in the learning zone where the performance is the biggest but the arousal level is under control.

There are many approaches and definitions of problem and problem solving. According to behaviourism, problem is actually a stimulus to which humans cannot give effective response (Skinner, 1973; Davis, 1973; D’Zurilla & Nezu, 1982). According to professional research literature a problem exists when there is a differentiation between the current state and the desired situation (goal) and this differentiation can cause tension in the person who perceives it. Other experts stressed some kinds of barriers (lack of information, solution method, series of actions) in problem situations when the goal cannot be reached (Dunker, 1945; Johnson, 1972; Jackson, 1983; Dörner, 1976; Newel & Simon, 1972; Kahney 1993; Mayer, 1992). Further research efforts focus on those problems in which the goal itself is the missing or the unclear element (Copeland et al., 1993). Copeland et al. consider problem “as a healthy, normal, and creative process in which capable practitioners attempt to make sense of puzzling or challenging phenomena, identify areas of practice that bear scrutiny, define particular goals for improvement, and pursue actions explicitly intended to accomplish them (...). Problem is “(...) a situation in which there is doubt, uncertainty, hesitation, or challenge” (1993: 348).

Several other accounts make a distinction between task and problem. Task is where the “barrier” is known or the solution of the situation can be reached with

a familiar algorithm (Kantowsky, 1981). Important differences between task and problem (unfamiliar task) include the distance (gap) and interaction between task requirements and the solver. Therefore, a situation can be a task or a problem depending on the personal perception whether it is in the comfort, learning or panic zone. “The same task may constitute a problem for one solver, but not for another (Funke & Frensch, 1995)”. So a phenomena itself is a neutral thing and can be neither a task nor a problem without a person. It becomes a negative or positive occurrence, task or problem only when an individual comes into contact with it by cognitive processes.

Pedagogical problems are actually phenomena that are derived from the effect of the teaching-learning process. It is the phase when the school itself (regulations of the institution, national/local curricula, school members), the students' personality (and their family background) and the teacher's task and competences (planning, acting, reflecting) come into contact. Consequently, pedagogical problems can be any kinds of problems at any stages of the teaching process that are connected to the phenomena of classroom teaching. A phenomenon becomes a problem when the teacher perceives it as a problem. A viewpoint of a pedagogical situation is therefore influenced by personal, situated, and professional factors (see [Figure 4.3.1](#)) (Flores & Day, 2006). Pedagogical problems are usually ill-structured, highly subjective, and situation-related phenomena. Therefore, according to Shavelson and Stern (1981) teachers face complex problems in teaching.



*Figure 4.3.1. Main factors of teachers' perception in a pedagogical situation*

CHAPTER 4

*Activities*

WARM UP ACTIVITIES

*1. It is like ...*

Participants can define the word of problem with individual associations. Comparing the answers can draw a picture about the different meanings and approaches of problem.

*Table 4.3.1. Sample material for It is like ... activity*

---

The problem is like a _____ because _____
---

---

*2. How much does it bother you?*

The exercise helps the group members to realize that everybody can have different cognition about the same issue. The educator presents the given situations (Table 4.3.2 also see Appendix, No. 5). Participants have to evaluate on a 1–5 scale (1: least, 5 very much) according to how much the mentioned situation makes them angry. After that they discuss what kind of personal differences can occur between them regarding the least bothersome and the most bothersome situation (Source: Croft, Crolla, & Mida-Briot, 2003).

*Table 4.3.2. Sample material for How much does it bother you? activity*

---

<i>Situations</i>	<i>Score</i>
1. Someone jumps in front of you in a queue.	
2. You lose your house key.	
3. You are late because someone kept holding you up.	
4. You overhear someone criticising your work.	
5. You are stuck in the traffic jam and you need to get home.	
6. You express your opinion and someone laugh and tells you not to be ridiculous.	
7. You are asleep and are awakened by loud music from next door.	
8. You are accused of something you have not done.	

---

*3. Let's make own definition!*

Participants work in groups. First, every group member concentrates on the word “problem” and collect their associations of the word to every sound. After that, the

groups make a definition of a given problem by using the most important words from the brackets. With the help of the trainer, every group can share their definition and discuss the similarity and the difference between them.

*Table 4.3.3. Sample picture for making definitions*

<i>A</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>L</i>	<i>M</i>	<i>P</i>	<i>S</i>
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

---

#### MAIN EXERCISES

##### *1. What is the difference?*

The participants can distinguish between challenge, task and problem in pair work. They can share their impressions, approaches, opinions and practical experiences concerning these expressions by filling the set together (Figure 4.3.2).



*Figure 4.3.2. Sample picture for What is different? activity*

##### *2. Zone Model*

Participants can realize where the border is in different pedagogical situations, outlining those aspects in which they feel comfortable (comfort zone) and in which they do not (learning and panic zone). The trainer asks participants to fill every zone in the picture concerning the teaching-learning process and then they can have a discussion about the experiences (Figure 4.3.3 see also Appendix, No. 6).

## CHAPTER 4

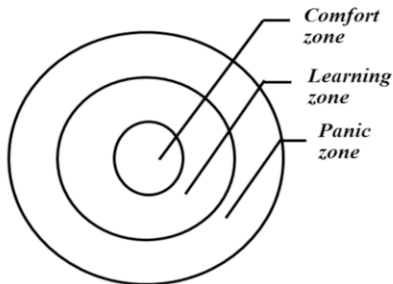


Figure 4.3.3. Source materials for Zone model (based on Luckner & Nadler, 1997)

### EVALUATION

#### 1. Reflection in three sentences

Participants can reflect to the block by finishing three sentences (see [Table 4.3.4](#)) and share them with the group.

Table 4.3.4. Source material for evaluation

---

I have already known before the block:  
I learnt today:  
I would like to know:

---

### ACTIVITIES FOR FURTHER REFLECTION

#### 1. Let's go back later!

Participants are kindly requested to check their examples a couple of months later. It can be useful to examine whether any changes happened or not.

4TH BLOCK: HOW DOES THE PROBLEM SOLVING PROCESS WORK?

*Aim of the block*

The aim of this block is to familiarize participants with the main aspects of the problem solving process. It also helps participants think in a system by taking the steps of the problem solving process as a circle and as a whole.

*Theoretical background*

Pedagogical problems related to the teaching-learning process are considered as situations or phenomena teachers perceive as problematic either due to the lack of solution or to some other barriers preventing them from reaching the desired state. Lazarus and Folkman offered a series of options beside confrontative coping to deal with a problem situation in a positive manner. The suggested approaches include: “distancing”, “self-control”, “seeking social support”, “accepting responsibility”, “escape-avoidance”, “positive reappraisal,” along with “planned problem solving” (Folkman et al., 1986: 995). Teachers’ conscious, “planned problem solving” is considered as a metacognitive, reflective process usually in the pre- or the post-active teaching phase (see [Table 1.1](#)). It presupposes that teachers consider themselves as researchers of their own practice.

In general, problem solving is a cognitive process, during which one makes an effort to transform a particular situation into a goal situation when no obvious method of the solution is available (Mayer & Wittrock, 2006). Reviewing the history of problem solving theory as a cognitive process, it is necessary to highlight some important steps.

Behaviourists considered problem-solving as a passive, reproductive process of stimulus and response (Thorndike, 1911). Early gestalt psychologists asserted that problem solving is a trial-and-error process or the reproduction of former responses. Later, Köhler, Wertheimer, Duncker completed the gestalt theory and emphasised the problem solver’s productive behaviour concentrating on the structure of the problem and the process of restructuring (Eysenck & Keane, 2010). Researchers of information-processing theory, artificial intelligence, and cognitive psychology went further in the identification of problem solving. Problem-space theory was a significant starting point considering the problem solving process as a guided research by mental operators going through a problem space of alternative possibility to reach the goal knowledge state (Newel & Simon, 1972). Cognitive scientists also found that a real-life problem-solving situation is a very complex process. Research efforts on Complex Problem Solving follow a North American and a European route as well. In North America, research, mainly elaborated by Herbert Simon, focused on problem solving by different knowledges and fields (mechanical, political, managerial aspect). In Europe, Donald Broadbent and Dietrich Dörner concentrated

on the development of problem-solving by examining the nature and different aspects of the process itself (Funke & Frensch, 1995). They also described some features of the complex problem-solving situation like intransparency, polytely, complexity of situation, connectivity of variables, dynamic development, time-delayed effect (Funke, 1991).

Successful problem solving depends on internal (such as the solver's cognitive, emotional, personal, and social ability and knowledge; earlier experiences; problem solving strategies; motivation, attitude and belief system) and external factors (problems structure, problem context, environmental factors) (Funke & Frensch, 1995; Schoenfeld, 2013).

Many studies of problem-solving described a couple of stages of the process usually consisting of 4–7 steps. The common stages of the problem solving process (see [Figure 4.4.1](#)) include perception and problem setting – information gathering – finding alternatives – decision making – acting and evaluating (see Wallas, 1926; Osborn, 1953; Pólya, 1957; Gordon, 1974; Koberg & Bagnall, 1981; D'Zurilla & Nezu, 1982; Isaksen & Treffinger, 1985; de Bono, 1996). There are differences in the descriptions namely the number and the order of the steps, the emphasis, and the techniques they use in each step. The first descriptions emphasized the linearity of the process. Later, dynamic and cycled features of the process became prominent ones.



*Figure 4.4.1. Common stages of the problem solving process*

It is also important to mention that most phases of the problem solving process involve divergent (creative) and convergent (critical) thinking (see [Figure 4.4.2](#)).

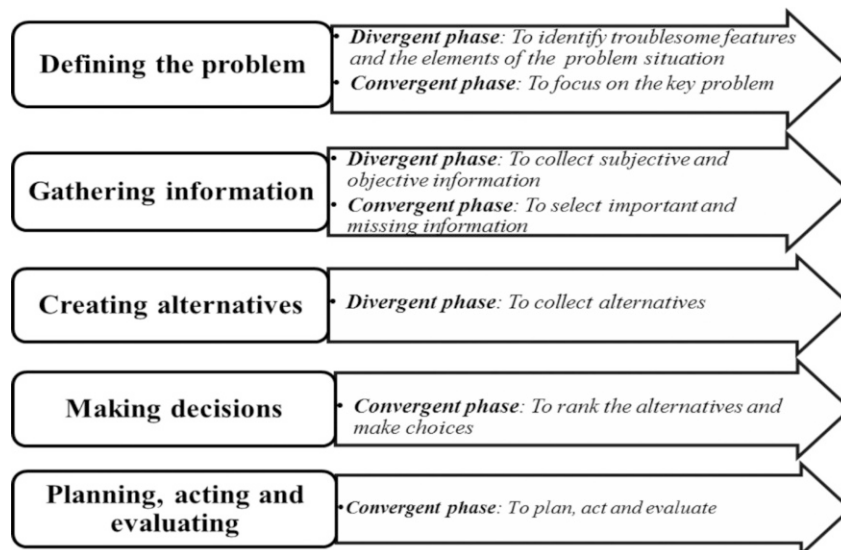


Figure 4.4.2. Convergent and divergent phases of the problem solving process

### Activities

#### WARM UP ACTIVITIES

##### 1. Open ended sentences

Educators pass one or two of the unfinished sentences seen in [Table 4.4.1](#) for the participants. Then they are supposed to finish the sentences regarding their teaching profession.

##### 2. Definitions of the problem solving process

Participants work in groups of five. Each member of these groups gets different definitions of the problem solving process ([Table 4.4.2](#) see also Appendix, No. 7). Members have to read and interpret their text by themselves. This stage is followed by a group discussion in which group members can explain their interpretation of their text and their opinion about each other's definitions. In the last session the whole group discusses the meaning of problem solving together.



CHAPTER 4

*Table 4.4.1. Source material for open ended sentences*

---

I like when ...  
I am not sure ...  
I am proud of ...  
I would like to have ...  
The most important for me is ...  
I am afraid of ...  
I would like avoid ...  
I do not like when ...  
I am eager to ...  
I am satisfied when ...  
I am curious about ...

---

*Table 4.4.2. Definitions of the problem solving process*

- 
- A) “Complex problem solving implies the efficient interaction between a solver and the situational requirements of the task, and involves a solver’s cognitive, emotional, personal, and social abilities and knowledge.” (Funke & Frensch, 1995: 18)
- F) During the problem solving process the given situation is transformed into the desired situation. (Hayes, 1981)
- G) “If a detailed strategy is already known for reaching the goal, no problem solving is required.” (Wilson & Keil, 2001: 674)
- H) “Problem solving is defined as the self-directed cognitive-behavioral process by which an individual, couple, or group attempts to identify or discover effective solutions for specific problems encountered in everyday living. More specifically, this cognitive-behavioral process (a) makes available a variety of potentially effective solutions for a particular problem and (b) increases the probability of selecting the most effective solution from among the various alternatives.” (D’Zurilla & Nem, 1932: 12)
- I) “We view problem solving as a healthy, normal, and creative process in which capable practitioners attempt to make sense of puzzling or challenging phenomena, identify areas of practice that bear scrutiny, define particular goals for improvement, and pursue actions explicitly intended to accomplish them.” (Copeland, Birmingham, De La Cruz, & Lewin, 1993: 348)
- 

MAIN EXERCISES

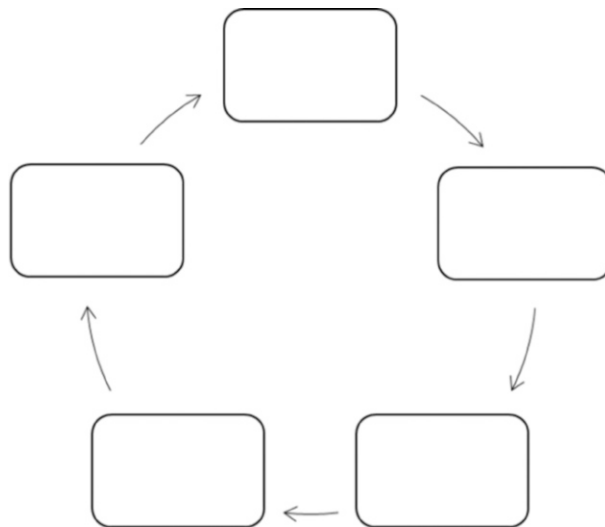
*1. Grouping*

This activity help participants to think over the steps of the problem solving process. Participants are supposed to work in small groups to create a five-step problem

solving model by using the given expressions and chart. After finishing the chart the group can compare their outcome and discuss the findings. The trainer can also explain the most usual division of the process.

*Table 4.4.3. Words for grouping activity*

ideas	information	decision	goal	plan	evaluating	aim
reasoning	selecting	acting	context	problem	feelings	
solutions	facts	choice	alternatives	experience	involved	
persons	possibilities	problem	setting	opinions	causes	



*Figure 4.4.3. Sample material for problem solving steps*

*2. How good am I ...?*

Knowledge of the self plays a significant role in the problem solving process. This exercise gives participants the possibility to examine themselves and their potential to be successful in each step. Participants get a sheet seen in [Figure 4.4.4](#) (also see Appendix, No. 8). They can rank their success according to the numbers indicated under the titles: number 1 means that they are not successful in the particular field, while number 9 indicates success in that field. When they finish all steps they can share their experiences with each other with the help of the trainer. They are also welcome to add any specific techniques for the steps of problem solving.

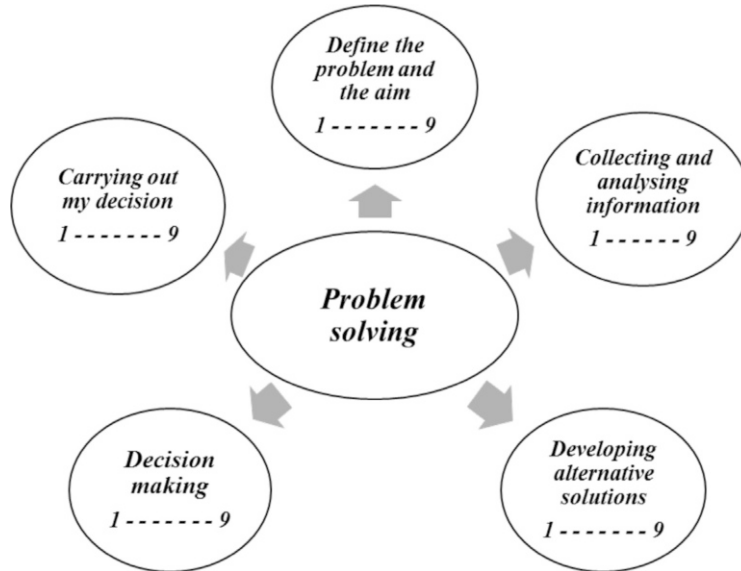


Figure 4.4.4. Sample material for *How good am I ...?* activity

#### EVALUATION

##### 1. Question

Concluding the block, the facilitator asks every member to recall one question that came up during the block.

#### ACTIVITIES FOR FURTHER REFLECTION

##### 1. More questions

For further reflection on this block participants can consider the following questions:

##### *Useful questions:*

- What kind of problem solving techniques do I know?
- What kind of tools or techniques have I tried yet?
- How do I usually handle a problematic situation?
- Which step do I take when I solve a problem and which steps do I skip or miss?
- Why?

5TH BLOCK: WHY IS IT A PROBLEM FOR ME?  
(PERCEPTION, PROBLEM IDENTIFICATION AND STATING THE GOAL)

*Aim of the block*

Tools used in this block help participants to get acquainted with the connection between problem and perception and they can also find the focal point they would like to change. The block also enables participants to understand that there are several ways to consider the same problem. This phase of the problem solving process is about to determine the starting point and the direction of the resolution effort. Tools used here aim to enable participants to create a clear problem focus and goal state.

*Theoretical background*

“A reflective teacher is not only aware of these problems, but she or he also takes care to define them in an explicit, conscious way” (Copeland et al., 1993: 350).

According to several experts, a problem may arise when there is a given state (problem setting), a desired state (aim, goal state, desired situation) and a barrier between these two (see more in the 3rd block). Pedagogical situations are influenced by several internal and external factors therefore they usually generate complex problems with significant subjectivity and situatedness. The problem focus is closely connected to the perception of the situation.

Understanding the problem solver's own role in the situation is necessary because it has a huge effect on how the role of the others is considered (Schön, 1983). To be more precise, it is necessary to decide who owns the problem (Who exactly has the problem? see: Gordon, 1974) . It is also important to realize whether it is the real problem or an effect of another one. It may happen that the pedagogical problem is part of a system problem and in many cases the system cannot be changed. In addition to the fact that the teacher is aware of this situation, she has to deal with the problem on behalf of the persons involved. There are more techniques to support problem setting (drawing, creating metaphors, and picking up bothering things). “When we set the problem, we select what we treat as the ‘things’ of the situation, we set the boundaries of our attention to it, and we impose upon it a coherence which allows us to say what is wrong and in what directions the situation needs to be changed” (Schön, 1983: 40). The problem owner can approach the situation from different perspectives and distance with the technique called framing. “When a practitioner becomes aware of his frames, he also becomes aware of the possibility of alternative ways of framing the reality of his practice” (Schön, 1983: 310). Fairhurst and Sarr (1996) described more framing techniques such as metaphor, stories (creating narratives), slogan, and contrast. “Daily, hourly, even minute by minute, teachers attempt to solve problems that arise in the classroom. The way in which they solve those problems is affected by how they pose or “frame” the

## CHAPTER 4

problem” (Zeichner & Liston, 1996: 5). Having set the problem, it is necessary to state and clarify the goal. It delays solvers’ intention and the purpose as well. It is important to mention that if the goal is precisely defined, one has better chance to solve the problem successfully.

### *Activities*

#### WARMING UP ACTIVITIES

##### *1. What does it mean to you?*

People have different understandings of the content of a particular expression. This task demonstrates several different ways of using a word for the purpose of interpreting a given situation. Every participant is supposed to answer the questions with a number representing the sentences. The trainer goes along the questions one by one and makes notes on a board about the smallest and the highest scores of the participants’ answers. There can be an interesting group debate about the different understanding of the questions.

#### *Useful questions:*

How do the answers differ from each other?

What is the most surprising in the exercises?

How can cultural differences affect different understanding of the same word, sentence or a situation?

*Table 4.5.1. Source material for what does it mean to you?  
activity (also see Appendix, No. 9)*

---

<i>What does it mean to you ... ?</i>
... to be late a bit: _____ ? (How many minutes?)
... to sleep a lot: _____ ? (How many hours?)
... to get up early: _____ ? (When?)
... to have a lot of friends: _____ ? (How many people?)

---

##### *2. Draw it! (Self-Case Reflection)*

Drawing a picture of the current problem can help to visualise the main features of the given situation (persons involved, and their relationships, the context etc.) (see more Malouff, 2014). The educator passes a sheet of paper to the problem owners and let them draw their picture about their situation. When the pictures are finished, their pair can ask questions for the sake of a better understanding of the problem. (The suggested method for this activity is peer pair work.)

MAIN EXERCISES

1. *Who has the problem? (Self-Case Reflection)*

Sometimes we consider problems that are not ours, or the problem may be solved better by someone else. When participants are able to recognize the owner of the problem, they go one step further (see more Gordon, 1974). The facilitator draws a table (see Table 4.5.2) onto the board and asks participants to think about the owner of their situations. Then, they can discuss their views.

Table 4.5.2. Sample picture for *Who has the problem?* activity

Another person	It is her/his/their problem
	• Problem Solving Process in her/his/their favour
No problem	
Me	• Problem Solving Process in my favour
	It is my problem

2. *Factors of frustration (Self-Case Reflection)*

A problem well stated is a problem half-solved. (Charles F. Kettering)

Perception is a subjective process affected by contextual, affective, and professional factors. A problematic situation can have many problematic sides, as there are ill-structured problems where participants need to figure out why they perceive the situation as a problem. What is the cause of frustration in the given situation? What bothers the participants the most in the problem? This step is very important because different focuses need different solutions. If the focus is not clearly defined, the solution will be false. (The suggested method for this activity is peer pair work.)

Table 4.5.3. Sample material for problem focus (also see Appendix, No. 10)

Why does this situation frustrate me?	1.
	_____
	2.
	_____
	3.
	_____

3. *Defining the aim (Self-Case Reflection)*

Figure 4.5.1 (see also Appendix, No. 11), participants can see how perception can affect problem posing and goal setting. At this step, group members can see the purpose of the solving process clearly. (The suggested method for this activity is peer pair work.)

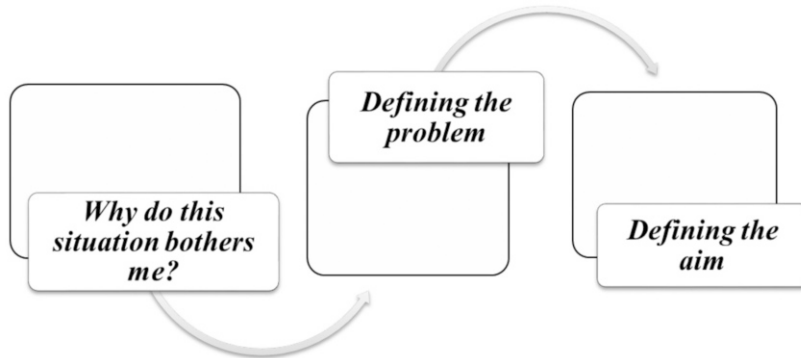


Figure 4.5.1. Source material for problem and goal focus

EVALUATION

1. *Are you satisfied?*

The facilitator makes a final round about by surveying the participants’ satisfaction and writes four questions onto the board that could be answered by the members (Table 4.5.4).

Table 4.5.4. Block sample for block satisfaction

---

*Are you satisfied with:*

1. - your contribution to the block?
2. - the participants’ contribution to the block?
3. - the facilitator’s contribution of the block?
4. - the tools and the activities used in the block?

---

ACTIVITIES FOR FURTHER REFLECTION

1. *Metaphor (Self-Case Reflection)*

“Choosing language to frame people’s actions and events is like moving a telescope into position” (Fairhurst & Sarr, 1996: 125). Thinking about the situation by expressing it with a metaphor can help participants to realize their approaches to

the situation. Group members may think over what kind of thing or phenomena their situation can be similar. It is not an easy task so the trainer can help them by setting examples. However ones they find a word the situation can be seen from a new aspect.

*Table 4.5.5. Source material for "Metaphor" task*

---

What can this situation be compared to?  
This situation is like a \_\_\_\_\_ because \_\_\_\_\_

---

## *2. Strategies in conflict situations*

There are many well-developed strategies concerning problems that include a conflict situation between two people. Killmann and Thomas (1977) helped participants to identify their most frequently used strategy in conflict. Depending on the result, they can develop their behaviour type in a more cooperative or more assertive way to find the balance. Gordon's method provides communication techniques and tips for better (assertive and cooperative) problem solving in conflict situations.



## CHAPTER 4

### 6TH BLOCK: WHAT COULD BE THE REASON OF THIS PROBLEM? (INFORMATION 1)

#### *Aim of the block*

This block concentrates on the connection among the different types of information. The techniques employed help teachers to look behind the scenes and find connection between the causes and the effects of the situation.

#### *Theoretical background*

Teachers are supposed to react quickly and spontaneously (see [Table 1.1](#)) during the interactive phase because there is no time to think of all aspects of the situation in those multidimensional settings. That's why these reactions can be beneficial only on the surface of the situation. When these reactions are ineffective and the situation occurs again, a deeper analysis of the given context is absolutely necessary. There might be a relationship between the needs of the persons involved and the core problem of the situation. The Fishbone diagram (or cause and effect, Ishikawa diagram) helps to take a look at a possible relationship between cause and effect by using categories (such as people, methods, process, materials, environment) and by identifying the origin of a particular situation. It was created by Kaoru Ishikawa in the 60's (Ishikawa, 1982; Tague, 2005).

Each problem situation includes at least one involved person (who perceives the problem). Teachers should consider what kind of needs or anxieties the involved participants have (children, parents, colleagues). It can be a highly valuable component of the problem solving process because these factors can possibly be the cause of the problematic situation.

#### *Activities*

##### WARM UP ACTIVITIES

##### *1. What colour are you?*

It is a good starting activity letting the participants to think about and share how they feel about themselves right now. Group members choose a colour that expresses their current mood. With the help of the facilitator, they share their feelings by the chosen colour.

##### *2. Who has the truth?*

Participants work in pairs. Every pair gets a picture outlined in [Figure 4.6.1](#) (see also Appendix, No. 12) and finds an appropriate slogan or title of the picture by their discussion about how they understand it. In the whole group discussion the pairs can set their interpretation of the picture by sharing the respective slogans.

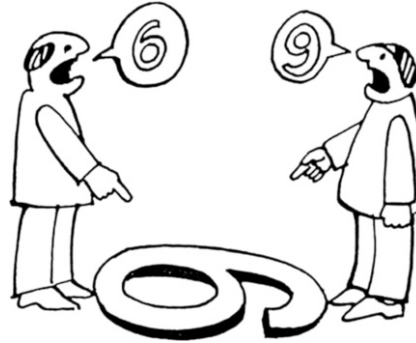


Figure 4.6.1. Picture for “Who has the truth?” task  
 (Source: <http://i1.wp.com/chelseafc.taccs.hu/wp-content/uploads/sites/37/2014/01/v%C3%A9lem%C3%A9ny.jpg>)

*Useful questions for discussing:*

- Have you ever been in a situation like this?
- In which situation can it happen?
- How can individuals prevent or eliminate this situation?

MAIN EXERCISES

*1. Needs and anxieties of the persons involved (Self-Case Reflection)*

This activity provides teachers an opportunity to think over who the most involved persons are in the situation (including themselves as well). After they identify the first three persons they can consider their needs and their anxieties one by one by completing the sheet on [Table 4.6.1](#) (see also Appendix, No. 13). During the group discussion they can uncover some connections between these elements and the problem state itself. (The suggested method for this activity is peer pair work.)

*Table 4.6.1. Source material for noting down needs and anxieties of involved persons*

<i>Who? (1.)</i>	<i>Who? (2.)</i>	<i>Who? (3.)</i>
<ul style="list-style-type: none"> <li>• Her/his needs:</li>   <li>• Her/his anxieties:</li> </ul>	<ul style="list-style-type: none"> <li>• Her/his needs:</li>   <li>• Her/his anxieties:</li> </ul>	<ul style="list-style-type: none"> <li>• Her/his needs:</li>   <li>• Her/his anxieties:</li> </ul>

## 2. Fishbone Diagram (Self-Case Reflection)

In this task, members receive an empty Fishbone diagram (Figure 4.6.2 see also Appendix, No. 14). It has a horizontal arrow, which is the body of the fish picture and ends with the problem focus which is placed on the head of the fish. From this arrow, some diagonal lines rise completing the bones of the fish. These bones symbolize the possible categories of the causes of the situation. The main bones can be divided into smaller bones that symbolize the sub-causes.

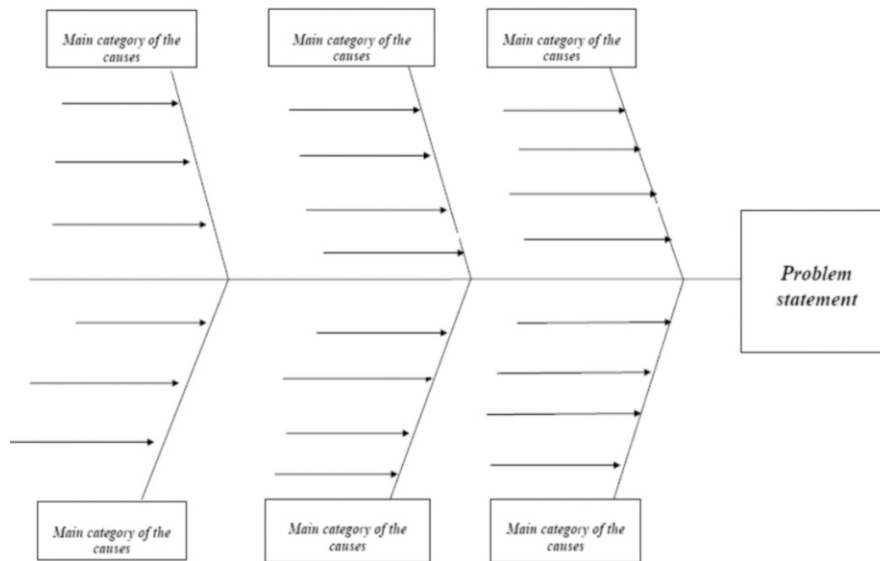


Figure 4.6.2. Fishbone diagram

Participants fill in the diagram related to the situation they deal with. First, they identify the problem and then they can ask the following question: Why does/did it happen? They can get deeper and deeper if they can ask the question again and again for themselves (Tague, 2005).

After finishing the picture, the group can discuss what kind of experiences and new pieces of information they got by completing the diagram. (The suggested method for this activity is peer pair work.)

*Useful question for discussing:*

- What kind of categories do come up?
- What kind of new information did you get?
- What are the major causes?
- What is the missing information?

EVALUATION

*1. No, partly, yes*

Filling the sheet (Table 4.6.2) helps to have a discussion about the efficiency of this block.

*Table 4.6.2. Source for evaluation*

	<i>No</i>	<i>Partly</i>	<i>Yes</i>
The block was useful			
I have learned new techniques			
I have found new alternatives for my challenge			
The learning environment was appropriate for the exercises			

ACTIVITIES FOR FURTHER REFLECTION

*1. From their side (Self-Case Reflection)*

Recalling the challenging situations from one (or more) involved persons' view can give new aspects, new cause and effect connections.

## CHAPTER 4

### 7TH BLOCK: FACTS AND OPINIONS (INFORMATION 2)

An expert is someone who has succeeded in making decisions and judgements simpler through knowing what to pay attention to and what to ignore. (Edward de Bono)

#### *Aim of the block*

The aim of this block is to familiarize group members, on one hand, with their opinions, assumptions, impressions, or feelings and, on the other hand, to get acquainted with the objectives. The tasks used here also help participants to examine the situations from other people's points of view.

#### *Theoretical background*

“In tackling a problem it is useful to gather as much information as possible and then to decide whether the solution is going to depend on more information or on a new idea” (de Bono, 1990: 49).

In challenging situations people tend to combine and handle the facts and their feelings equally. It comes from the fact that a situation becomes a problem when somebody defines it as a problem therefore own perception plays an important role in the process. One significant step towards the solution is when the problem solver divides the situation into objective and subjective factors. It can also be useful to examine the source of the different information including the involved persons' aspects. It may happen that the teacher realizes she does not know the involved persons' point of view, however, she believes she does. During this step, the solver is supposed to decide what information she should pay attention to and what she should not.

This step requires “lateral thinking” (see de Bono, 1970) which is the result of changing and examining every aspect and point of view.

#### *Activities*

##### WARM UP ACTIVITIES

##### *1. What is happening on the picture?*

The facilitator brings a picture or photo that has two main topics. He cut the picture in two in that way that the two different parts of the picture have different meanings, but if it is put together it leads to a new understanding as well.

The facilitator divides the group into two and the first group receives the first part of the picture the second has the other one.

*Basic questions for one part of the picture:*

Who are in the picture?

Where is the activity described in the picture taking place?

What is happening in the picture?

*Helpful questions for discussion:*

How do you perceive the picture before and after viewing the whole image? What was the difference?

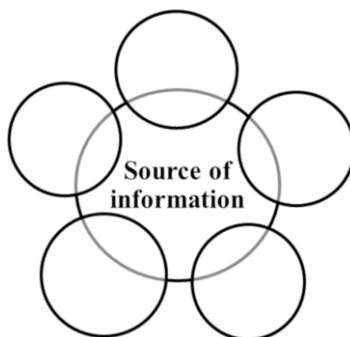
How have the details of the picture changed in your mind after gaining a total view?

How has your view point of the picture changed?

#### MAIN EXERCISES

##### *1. General sources of information (Self-Case Reflection)*

The task of the participants is to think over from where (parents, colleagues, literature) and how (observation, interview) they can collect information regarding the situation they wish to solve.



*Figure 4.7.1. Sample picture for general sources of information*

##### *2. Objective and subjective information (Self-Case Reflection)*

When teachers speak about their problematic situation they do not usually realize their facts, opinions or impressions. They tend to handle these elements without any distinction: for example, they frequently handle an opinion as a fact. It is also important to consider where the information comes from. This exercise enables participants to divide the objective and the subjective aspects of the situations and to see the quality and the level of the information clearly (see [Table 4.7.1](#) see also

CHAPTER 4

Appendix, Nos. 15–16). After filling the tables participants can discuss how their thinking process about their situation developed and what was the most benefit of exercise. (The suggested method for this activity is peer pair work.)

*Table 4.7.1. Source material for dividing objective and subjective information*

Objective information			
Fact	The fact I know ...	From where and from who do I collect these information?	
Clarified issues	What I do not know ...	What kind of information do I need?	
Subjective information			
Feelings, emotions	Involved person	His/her feeling	Why do I think it?
Opinion, assumption, impression	Who?	What does he or she think?	How do I know it?

EVALUATION

*1. The most, the least*

Participants can summarize what the most and the least useful technique was during this block.

<p>The most useful technique for me ...</p> <p>The least useful technique for me ...</p>
--

*Figure 4.7.2. Source material for evaluation*

ACTIVITIES FOR FURTHER REFLECTION

*1. Few months later...*

Trainers are supposed to tell the participants to go back to these completed tables and consider them few weeks or months later. The situation may be all over, or maybe it will reach its climax at that time. Reviewing the respective notes is also useful in both cases.

*2. Unsent letter (Self-Case Reflection)*

This exercise supports lateral thinking and to discover the subjective side of the situations. The method basically requires the participants to draft in their minds an honest letter to one of the involved persons (Moon, 2004: 199). It can be successfully used, when the problem situation includes conflict among people as it can help to convert the affective component of the situation into I-messages (see more about I-messages: Gordon, 1974).



## CHAPTER 4

### 8TH BLOCK: COLLECTING ALTERNATIVE SOLUTIONS (POSSIBILITIES 1)

The best way to have a good idea is to have a lot of ideas. (Linus Pauling)

#### *Aim of the block*

In this block participants are encouraged to collect sources and those possible solutions for their challenges that are existing examples. The block also concentrates on how participants can transform disadvantages of the situation into advantages. Another purpose is to make participants become familiar with those kinds of activities that can provide them professional development in a particular domain.

#### *Theoretical background*

One of the most effective ways of finding a solution is collecting sources and looking for already existing and helpful examples in a similar topic. These existing examples can come from the solvers' earlier experiences or from other sources. It is called analogic thinking when the solver transfers information from one field (base domain) to another (target domain) in order to solve the problem of the target field (Eysenck & Keane, 2010). Analogical thinking (the cognitive process of seeking and applying correspondences between two phenomena) includes the steps of representation, retrieval, mapping, adaptation, and induction (see e.g. Hummel & Holyoak, 1997; Keane, Ledgeway, & Duff, 1994; Salvucci & Anderson, 2001).

There is a wide range of activities that help teachers to explore new approaches and alternatives in the problematic field (see MacGilchrist, Myers, & Reed, 2004; Zepeda, 2015). By providing problem solving patterns and sources related to a given topic, it also foster the target group to take part such activities (team teaching, peer observation, shadowing est.) that can become the most important part of their professional development.

Meaning, role and the method of professional development have various interpretations as different researchers focused on varying features and elements of this process (see Gall & Renchler, 1985; Day, 1999; Cochran-Smith & Lytle, 2001; Feiman-Nemser, 2001; Villegas-Reimers, 2003; Fullan, 1995, 2005; Broad & Evans, 2006; Borko, 2004; Tsui, 2007).

Teacher's professional development can be considered as a continuous (conscious or unconscious) formal and informal activity leading to the development of professional competences; and it is also a lifelong-learning process that begins at preservice teacher education and ends at retirement (Ganser, 2000; Villegas-Reimers, 2003; European Commission, 2010). In a wider wording: "Professional development consists of all natural learning experiences and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school, which constitute, through these, to the quality of

education in the classroom. It is the process by which, alone and with others, teachers review, renew and extend their commitment as change agents to the moral purposes of teaching; and by which they acquire and develop critically the knowledge, skills and emotional intelligence essential to good professional thinking, planning and practice with children, young people and colleagues throughout each phase of their teaching lives" (Day, 1999: 18).

There are many way of professional development depending on the context, the process and the content (Ganser, 2000). The development process can be supported by mentor or an expert, by peers or even via self-reflection (European Commission, 2010). At the same time a difference can be drawn among task-oriented, school-based or personal activities as well as activities for a policy implementation.

According to OECD research (2009) the most popular type of self-development is informal dialogue with colleagues (peer learning). While its greatest advantage is the apparent lack of financial limits or requirements, the effectiveness of such approach is still questionable. Furthermore, since empirical studies on the effectiveness of different type of development activities are few and far between, (OECD, 2009) it cannot be declared that one is better than the other. The issue has also contextual and subjective factors as well. Some key points, however, can be established in order to increase the adaptiveness of continuous professional development:

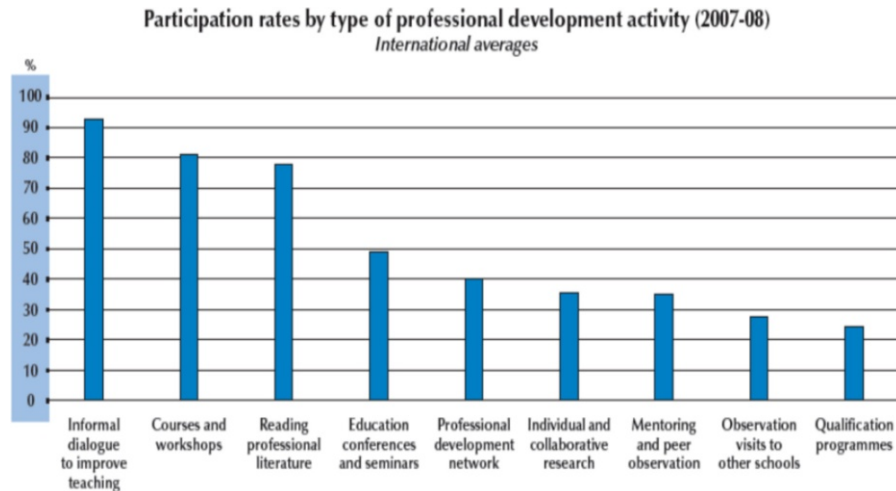
- it is based on individual as well as school needs
- experimental learning process implies that teachers are active learners working on own tasks of teaching, assessment, and observation by reflective practice
- it is embedded in a long-term process
- it is closely connected to the school practice environment
- it is linked with school changes
- it is a collaborative process creating professional learning communities within and between schools
- sustained and intensive process
- supported process (by external or internal experts)
- includes problem solving around a specific field
- it has wide variety relating to the difference of setting and school context (Villegas-Reimers summarizing, 2003; Darling-Hammond, 2008; Stoll et al., 2012).

### *Activities*

#### WARM UP ACTIVITIES

##### *1. The most popular ways of teachers' professional development*

Participants analyse the results of the international research scheme of OECD (2009a) (Figure 4.8.1 see also Appendix, No. 17) together by discussing and reflecting on it.



*Figure 4.8.1. The most popular ways of teachers' professional development*  
(Source: OECD, 2009: 57)

*Useful questions:*

How do you ensure your professional development in a problematic field?

Is this the same pattern in your career/school/nation?

What is the most and least popular way of development activity in your country?

Are there any more forms of professional development?

*2. Further activities for self-development*

There are several ways to expand knowledge about a specific field of education. The table below (Table 4.8.1 see also Appendix, No. 18) enables participants to think of the possibilities of self-development. Group members read the list and put their comments into the brackets. When they are finished, they can discuss their experiences directed by the facilitators.

*Useful questions for discussing:*

Which is the most popular form of professional development?

Which one have you tried? What was your experience?

Which one do you recommend to the others? Why?

What is the advantage of the activities?

What kind of difficulties do the implementation of the activities have?

TRAINING PROGRAMME FOR TEACHERS' PROFESSIONAL DEVELOPMENT

*Table 4.8.1. Activities for teachers' professional development*

<i>Activities</i>	<i>Comments</i>
to make an individual development plan	
to do research (action research, case study, lesson study etc.) about my own practice	
to do journal writing (or diary)	
to do reflective practice by audio or video recording of a lesson	
to collect feedback from students, parents, colleagues etc.	
to read books, journals and articles and search out more sources	
to have a mentor, coach or a critical friend	
to take part in school Training using the expertise available within the school	
shadowing: observe a fellow teacher/experienced colleagues in the same setting	
shadowing: observe a fellow teacher/experienced colleagues in different setting	
to take part in peer lesson observation	
to try exchange or replacement with another teacher, school	
to take part in collaborative planning or in good practice	
to be involved in a school project	
to organise meetings and discussions with teacher on different level and from different school in a topic of common challenge	
to organize peer group discussion in the school	
to invite a specialist into the school	
to create specialist forum groups	
to have supervision	
to take part in team teaching	
Other:	

*Based on Day (1999); MacGilchrist, Myers, & Reed (2004); Zepeda (2012)*

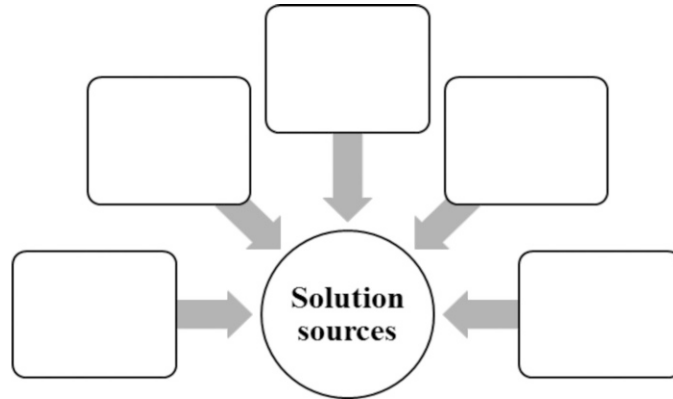


Figure 4.8.2. Sample materials for general sources of solutions

MAIN EXERCISES

1. General sources of solutions (Self-Case Reflection)

By using [Figure 4.8.2](#), participants identify persons, and other sources that can be helpful for their solution finding process. During the discussion, they can also give tips to each other. (The suggested method for this activity is peer pair work.)

*Useful questions:*

Who and what kind of sources can help and how in the current challenge?  
What kind of patterns can be employed to your situation?

2. Convert disadvantages into advantages (Self-Case Reflection)

This exercise ([Figure 4.8.3](#) see also Appendix, No. 19) is based on the idea that every situation that seems problematic has not only weakness but also strength factors. During this exercise, participants list the advantages and the disadvantages of the changing situations and try to convert them into a possible solution. (It is a bit similar to a popular tool called SWOT analysis that can help to identify the strengths, weaknesses, opportunities, and threats of a situation). (The suggested method for this activity is peer pair work.)

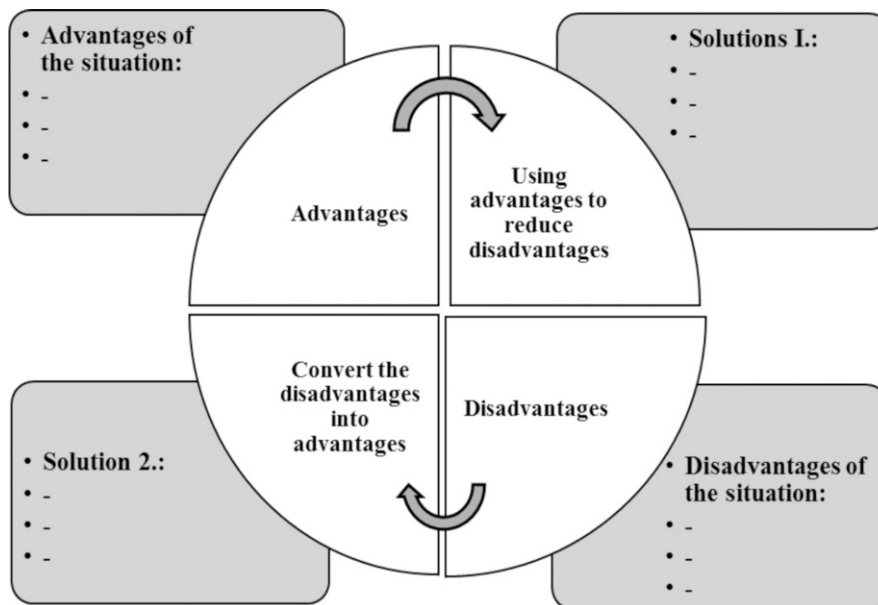


Figure 4.8.3. Source material for converting the disadvantages into advantages

#### EVALUATION

##### 1. Tell it by pictures

Group members choose one picture from different sets; (placed on the table by the educator) this picture can express their feeling about this block. Considering every picture, everybody can share their opinions and impressions about the block.

#### ACTIVITIES FOR FURTHER REFLECTION

##### 1. What would he/she say? (Self-Case Reflection)

This activity helps to move participants out from their view point or dislodge them from their positions. They think of a person who is already removed from the situation and imagine what he or she would tell in the same situation. This person can be anybody: a colleague, a specialist of a field, a relative or even a fictive individual person.

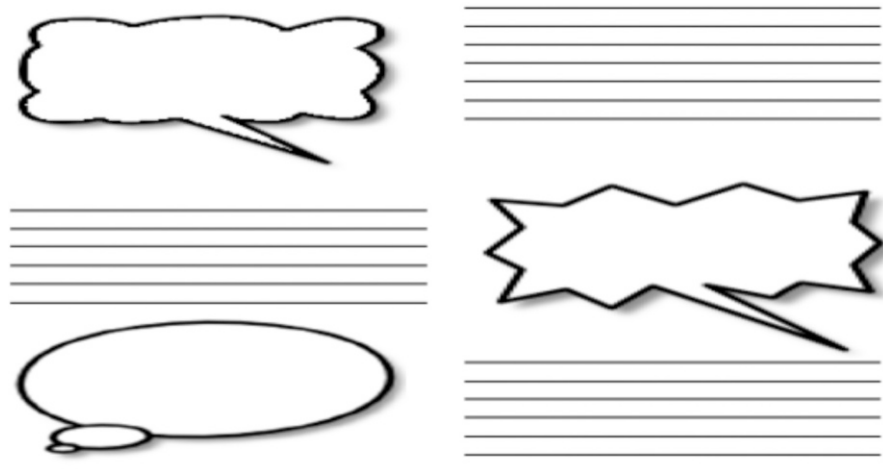


Figure 4.8.4. Illustration picture “What would he/she say?”

*Useful question:*

What would other people (an outsider) tell in this situation?

*2. What would you suggest? (Self-Case Reflection)*

Other perspectives can develop when the problem owner steps out from his role and looks at himself from a completely different point of view. Participants are supposed to imagine that a colleague, who is in the same situation, asks for advice.

*Useful questions:*

What would you advise a teacher who has a problem as you?

What questions would you ask in this situation?

9TH BLOCK: GENERATING NEW SOLUTIONS (POSSIBILITIES 2)

We can't solve problems by using the same kind of thinking we used when we created them. (Albert Einstein)

*Aim of the block*

The aim of the block is to collect as many alternatives as possible by coming up with new ways and forms of solution. It supports divergent thinking by tools and techniques and helps to increase the number of the alternatives concerning pedagogical challenges.

*Theoretical background*

In the problem solving process one of the most creative steps is solution finding where divergent thinking is a required phenomenon.

According to de Bono, dividing the goal into parts and going back from the possible goal state to sub-goals (called "concept fan") is one of the most powerful problem-solving methods (Bono, 1990: 59). It is based on Newel and Simon's means-end analysis where the solver attempts to reduce the differences between the actual and the desired state by creating sub-goals and mental operators towards them (Newel & Simon, 1972).

If we take dimension of change into consideration, individuals can focus on the content (the object of the problem), the process (attitude and strategies) and also the context (environment) of a problematic situation (Pettigrew & Whipp, 1991). If they follow this path, teachers have three basic possibilities to generate a change in a problematic solution. In most cases, teachers aim to change the source or the object of the problem itself (for example to change the children's behaviour). However, teachers can also change the environment around the problem which can result in the elimination of the given problem in these different circumstances (for example in group work or pair work). As it was mentioned above, a situation becomes problematic when the teacher perceives it as a challenge. Changing the attitude towards the situation can also help in many cases.

In other pedagogical situations, teachers need to be creative enough to solve the upcoming problem. Guilford (1977) claimed that problem solving and creative thinking were closely related aspects. Creating alternatives in a problem solving process requires creativity. As Young sums up: "Creative people do more than break away from old patterns. They do more than find alternatives. They diverge from familiar patterns, but then they converge on new solutions. They break laws to remake them. They make hard decisions about what to include and what to eliminate. Creative people innovate. They aim toward newness. This can be considered in several senses" (Young, 1985: 82). The so-called SCAMPER method (Eberle, 1984) supports divergent or creative thinking. It is an acronym that includes the



## CHAPTER 4

next cognitive processes: Substitute, Combine, Adapt, Magnify, Put to other uses, Eliminate, Rearrange. The idea is based on the fact that schema-based thinking can be a helpful factor, but it can also impede the problem solving process due to the phenomenon of functional fixedness (Birch & Rabinowitz, 1951). The cognitive operations used by the SCAMPER method enable the user to step out from the usual way of thinking. All of the letters include a thinking procedure: Substitute (S) gives another view of the situation by substituting one thing to another. This new view can help to come up with new ideas, alternatives and solutions. Combine (C) enables the thinker to mix the different parts of the situation. Adapt (A) is based on earlier experiences that can be a possible part of a new solution (see analogic thinking). Modify (M) means growing or reducing the parts of the situation and it can provide new insight about the types and the importance of the components. Put to another use (P) enables the solver to get new ideas by changing the use of a tool, an object etc. Eliminate (E) motivates the thinker to leave out less important factors, features or parts of the situation. Rearrange (R) aims to turn the situation upside down in the thinking process. These cognitive processes are similar to the so-called double reversal (Tague, 2005). In this technique the solver first considers how the opposite of the wished situation can be reached. The problem solver collects many possibilities and turns them into the opposite direction. De Bono uses a tool similar to SCAMPER which is called provocation (see more: de Bono, 1995).

### *Activities*

#### WARM UP ACTIVITIES

##### *1. Do you agree?*

Participants receive a list of quotations relating to creativity (Table 4.9.1 see also Appendix, No. 20). They discuss the meaning of the sentences and share their opinion about them in small groups. Then, every group summarizes what their discussion was about.

##### *Useful questions for a whole group discussion:*

Which of the quotations do you agree with most?

What does creativity mean?

Is creativity important in teacher's competence? Why?

Can you mention a school situation where you have to use your creativity?

*Table 4.9.1. Quotations for thinking about creativity*

a)	Creativity is seeing what everyone else has seen, and thinking what no one else has thought. (Albert Einstein)
b)	All human development, no matter what form it takes, must be outside the rules; otherwise we would never have, anything new. (Charles Kettering)
c)	Every act of creation is first of all an act of destruction. (Pablo Picasso)
d)	There is no doubt that creativity is the most important human resource of all.
e)	Without creativity, there would be no progress, and we would be forever repeating the same patterns. (Edward de Bono)
f)	All great deeds and all great thoughts have a ridiculous beginning. (Albert Camus)
g)	I can't understand why people are frightened of new ideas. I'm frightened of the old ones. (John Cage)
h)	The difficulty lies not so much in developing new ideas as in escaping from old ones. (John Maynard Keynes)
i)	We can't solve problems by using the same kind of thinking we used when we created them. (Albert Einstein)

## MAIN EXERCISES

### *1. Concept Fan (Self-Case Reflection)*

Participants identify the starting point of their problem situation and their main goal. Then, they go backwards from the desired state by breaking the goal into parts and by determining sub-goals that are closer to the starting point (Figure 4.9.1 see also Appendix, No. 21). After that, they try to determine sub-goals for the former sub-goals and these aims can easily be turned into solutions. (see de Bono (1990) "Concept Fan" tool) (The suggested method for this activity is peer pair work).

### *2. SCAMPER (Self-Case Reflection)*

Participants receive a sheet seen in Table 4.9.2 (see also Appendix, No. 22). They try some new ways and aspects of thinking related to their challenging pedagogical situations. They can write their ideas into the third column. It is important to emphasize that questions in this exercise enable them to dislodge themselves from their positions. Therefore, the solutions cannot be simple answers for the question. The aim of these cognitive operations is to let the person change his/her view and take other perspectives. (The suggested method for this activity is peer pair work.)

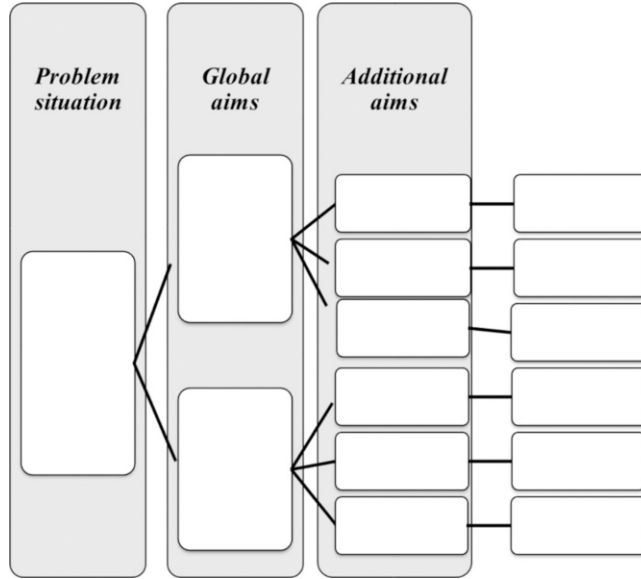


Figure 4.9.1. Source material for “Concept Fan”

Table 4.9.2. Source for SCAMPER method

<i>Cognitive process</i>	<i>Helpful questions</i>	<i>Own ideas</i>
Substitute	What will happen if I change the materials, the involved persons, methods, environment, feelings or the process of the situation in my thought?	
Combine	What kind of new ideas turn up if I mix some parts of the situation in my thought?	
Adapt	Do I know any similar situation context, materials etc. that I can use for creating my solution?	
Modify	Are there any new ideas turning up when I extend or decrease some components of the situation in my mind?	
Put to another use	What will happen if I use a material, tool, method completely differently than before?	
Eliminate	What are the least important factors of the situation? What happens if I eliminate some features, parts or factors of the situation?	
Rearrange	What will happen if I turn the situation upside down in my mind or if I move from the end to the beginning of the situation? What will happen if I reorganize the main component of the situation?	

EVALUATION

1. *What did you enjoy the most/the least?*

The final round is about whether the group enjoyed the tasks of the block or not. After finishing the two sentences (Table 4.9.3) the facilitator can also add some comments.

*Table 4.9.3. Source for evaluation*

<p><i>During the block, I enjoyed.....the most.</i></p> <p><i>During the block, I enjoyed.....the least.</i></p>
--

ACTIVITIES FOR FURTHER REFLECTION

1. *Dictionary (Self-Case Reflection)*

There are several useful techniques that can help the problem solver to find new approaches and ways of solutions. One of them is called Random Entry Idea Generating Tool (de Bono, 1970). It is a very easy technique where the solver chooses a random word from a dictionary and seeks a connection between the word and a challenging situation. It may seem to be very surprising but these associations can provide new views and possibilities.

10TH BLOCK: HOW DO I CHOOSE? (DECISION MAKING)

*Aim of the block*

In this block participants can get acquainted with tools and techniques that can help them to categorize the alternatives and choose the best solution in the dilemma situation.

*Theoretical background*

Decision is the final step of the problem solving thinking process before the interaction phase. In decision making, the problem solver anticipates the consequences of the different solutions, judges and compares them, and then chooses the “best” or potentially most effective solution (D’Zurilla & Nezu, 1982: 15–16). All of the mentioned and analysed aspects and factors of the case are considered in this step. It is a convergent (or critical) thinking process where individuals analyse, weigh, sort, and rank the possibilities in order to make an appropriate choice. A pedagogical situation does not let teachers make much trial and error action because these attempts affect the persons involved. Therefore, it is crucial to consider this step carefully. The two most important aspects of this process include the following: what is necessary to measure and how it is measured. The former depends on the aim itself and it is highly important during the goal setting phase. The latter refers to the thinking method used by the solver.

“The reflective teachers test the generated solutions mentally and select those she or he believes is best suited” (Copeland et al., 1993: 353). According to Sutcliffe and Whitefield (1979) there are two main factors that influence the decisions: the usefulness of the given possibilities and the chance of the outcomes. There are several other tools (especially in the field of marketing and management) that can ease the decision-making process: two dimensional chart; force-field analysis; future wheel.

These techniques can help participants to rank the possible solutions and define the priority steps.

A two dimensional chart is a matrix combining two important factors (Tague, 2005). Concerning alternative solutions, it can be divided as the term of the action (short or long term) and the owner of the action of the solution (inside or outside).

Future Wheel (or effects wheel) is a graphic tool for organizing thinking about future possibilities by defining primary, secondary and tertiary outcomes of a situation (Glenn, 1972; Snyder, 1993). It is supposed to improve the algorithmic thinking of the participants

Force-field analysis was originally developed for group decision by Kurt Lewin (1947). “An issue is held in balance by the interaction of two opposing sets of forces – those seeking to promote change (driving forces) and those attempting to maintain the status quo (restraining forces)” (Lewin, 1947: 341). This technique

helps to analyse forces for and against a change or a solution. However, it does not only indicate the advantage of the solution but also draws the attention to those possible risks that one should face when he/she chooses this solution. Keeping in mind the disadvantages of the chosen solution, one has more chances to avoid them.

*Activities*

WARM UP ACTIVITIES

*1. How do I make a decision?*

This task enables participants to think about their habit of decision making. Having filled in the table (Table 4.10.1 see also Appendix, No. 23) by marking 1–5 (1 – do not agree, 5 – agree), they can discuss their results and views about the decision making process. For this discussion, the facilitator can also use Table 1.1.

*Useful questions:*

What are the differences between the answers of the interactive and the planning phase?

What components of the decision making process are you most satisfied with?

In what area of decision making do you want to be more trained?

*Table 4.10.1. Statements relating to decision making*

<i>Statement</i>	<i>During interactive (teaching) phase</i>	<i>During planning phase</i>
I make a decision rather consciously		
I make a decision rather intuitively and spontaneously		
I use techniques for decision making		
I take my time to choose the best solution		
I analyse the situation before making a decision		
I collect as much information as possible before decision making		
I rank the alternatives before my choice		
I count on the risk factors of my decision		
I ask for advice before I choose between the alternatives		
I have huge routine		
I consider every possible effect of the alternative options		
I evaluate my decisions after the lessons		
I usually make proper decisions		

CHAPTER 4

2. *Let's sort alternatives! (Self-Case Reflection)*

This task is based on the two-dimensional chart method (see more Tague, 2005: 505–506). During this activity, members fill in the matrix with their possible solutions. It helps participants to sort their alternative solutions according to duration and the owner of the solution action. They are supposed to decide whether it is a short term or a long term solution. They can also select the possible solutions as whether it is an external solution (includes actions by colleagues or other supporting people, parents, students etc.) or an internal solution (includes the problem solver's own actions: changing methods, seeking relevant literature etc). (The suggested method for this activity is peer pair work.)

Table 4.10.2. Two-dimensional chart

External solution		
Internal solution		
	Short term	Long term

MAIN EXERCISES

1. *Future Wheel (Self-Case Reflection)*

“Making a decision makes you responsible for what happens afterwards” (Bono 1990: 33). This tool helps participants to consider the possible future consequences of a solution. Participants can predict and realize the most possible and the worst possible (or most dangerous) future actions (Figure 4.10.1 see also

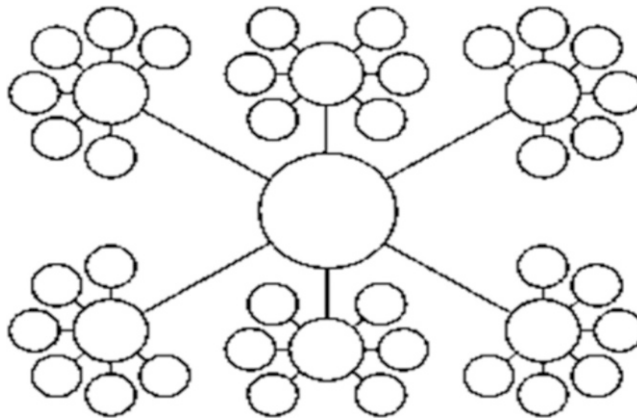


Figure 4.10.1. Future wheel (Source: <http://timvandevall.com/wp-content/uploads/2013/06/Printable-Graphic-Organizer-6.pdf>)

Appendix, No. 24). During the discussion, participants can share their findings, experiences, and opinions related to the task. (The suggested method for this activity is peer pair work.)

*2. Force-field analysis (Self-Case Reflection)*

“The decision-making process often begins at the information-gathering stage and proceeds through likelihood estimation and deliberation, until the final act of choosing” (Wilson & Keil, 2001: 220).

The technique enables participants to identify opposing factors of a possible solution and rank the alternatives (Tague, 2005). First, they collect alternative solutions for the desired situation. Then they take each alternative and make inquiries. Then they list the pros and cons by collecting the advantages and the disadvantages of the solution under investigation (see [Figure 4.10.2](#)). It can help to score the collected factors (1 = extremely weak and 10 = extremely strong). Techniques not only help to choose the best alternative but they also help to draw the participants' attention to those disadvantages of the chosen solution that are needed to be considered. (The suggested method for this activity is peer pair work.)

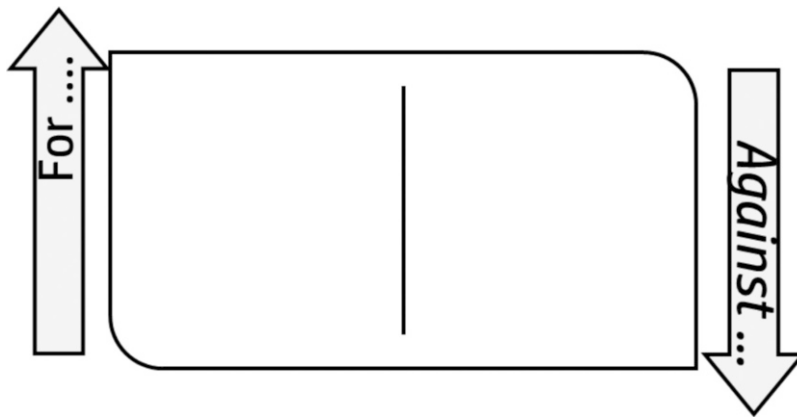
*Useful questions for discussion:*

How could this technique help decision making?

What is the final rank of the possible solution?

How can you weaken the strength of the restraining forces and increase the strength of the driving forces in the alternatives?

What kind of factors of the chosen solution can be considered?



*Figure 4.10.2. Illustration for force-field analysis*



## CHAPTER 4

### EVALUATION

#### *1. What do you take with you?*

After a short brainstorming, group members share things they would take from this block.

11TH BLOCK: PLANNING, PERFORMING, AND EVALUATING

*Aim of the block*

The block helps to summarize the main ideas of the whole course. It also provides tools for implementing the results of the decisions and it aims to evaluate the performance as well.

*Theoretical background*

After choosing the best solution, the next step is to plan the implementation of the decision. Teachers certainly know how important the role of planning is in the teaching-learning process. During planning, the solver can consider what, where, when and how he or she will exactly perform and what kind of tools or supports he or she needs (see Starbursting method: Tague, 2005: 129–130). This kind of “reflection for action” helps to avoid what de Bono mentions in a warning: “good decision badly made can be disastrous” (de Bono, 1990: 29). It is important to touch upon those factors that were disadvantageous in the chosen solution (see Force Field analysis).

As it was mentioned in the 4th block, problem solving is a dynamic and a circular process. After implementing the decision it is necessary to evaluate how the chosen solution worked (this is the process of reflection on action). If the solver is pleased with the new state of affairs, the initial problem situation is over. If the solver is not pleased with the new conditions, the problem solving cycle starts again (see [Figure 4.4.1](#)).

*Activities*

WARM UP ACTIVITIES

*1. What does it mean?*

Participants are supposed to finish some sentences (see [Table 4.11.1](#)) to consider these aspects of becoming a (professional) teacher (Feiman-Nemser, 2008). They can work in small groups and each group can have different sentences to discuss deeper. At the end of this activity each group can share their point of view.

*Table 4.11.1. Source material for What does it mean? activity*

---

*What does it mean?*

---

Learning to think as a (professional) teacher means ...

Learning to know as a (professional) teacher means ...

Learning to feel as a (professional) teacher means ...

Learning to act as a (professional) teacher means ...

---

CHAPTER 4

2. Overall summary

This warming up exercise summarizes all of the steps and tools used during the course. By completing the table (Table 4.11.2 see also Appendix, No. 25), participants can think of the different phases and methods of the problem solving process and their outcomes.

Table 4.11.2. Summarizing table

<i>Steps of problem solving process</i>	<i>Useful tools and methods</i>	<i>Comments</i>
Problem and goal setting		
Collecting information		
Developing alternatives		
Decision making		

MAIN ACTIVITIES

1. Starbursting (Self-Case Reflection)

Filling in a star-shaped picture (Figure 4.11.1 see also Appendix, No. 26) with all of the relevant factors and questions helps to consider the details of the chosen solution. (The suggested method for this activity is peer pair work.)

2. Evaluation of the implementation (Self-Case Reflection)

Evaluation of the action can enable participants to think over whether the chosen and tested solutions were successful or not. The questions in Figure 4.11.2 (see also Appendix, No. 27) can help participants to think about those changes that need to be

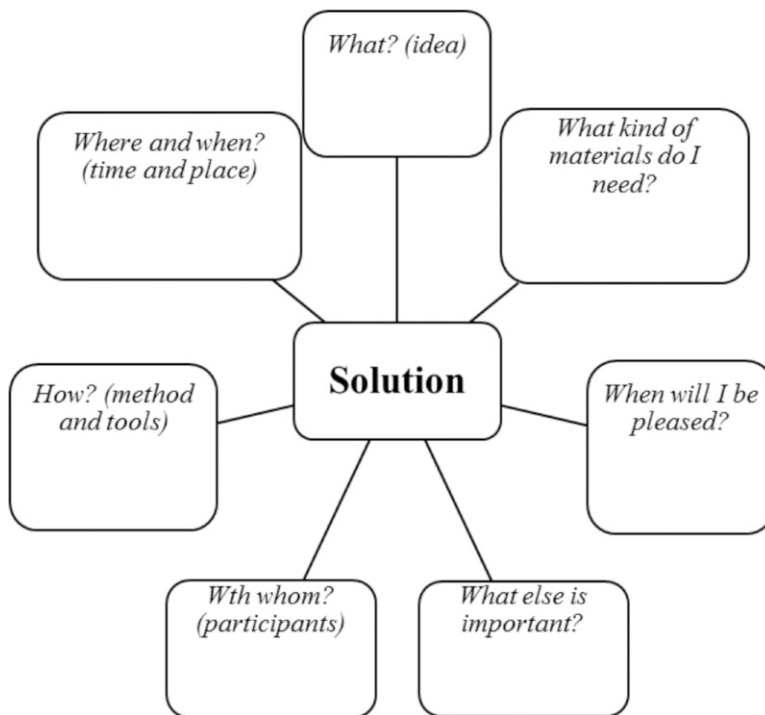


Figure 4.11.1. Sample for starbursting activity

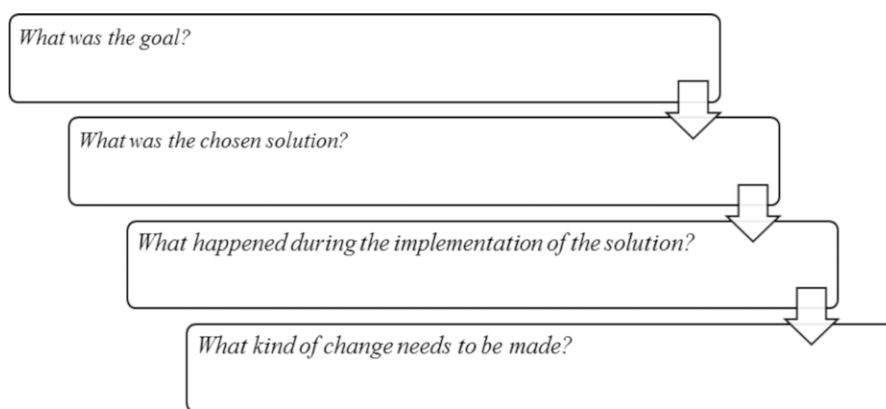


Figure 4.11.2. Source material for evaluating the implementation

## CHAPTER 4

made in order to reach the desired state. It is also important to rethink all steps of the problem solving process because in many cases the goal itself needs to be changed. (The suggested method for this activity is peer pair work.)

### *3. What did this situation teach me? (Self-Case Reflection)*

Every problem solving is a learning process. It is very useful if participants can think over what they had learnt from that particular challenge. It can include many things: a new viewpoint, a technique, a new knowledge about something or somebody.

#### *Useful questions:*

What did I learn from this situation?

Have you ever been in any situation where this new knowledge seemed to be useful?

## EVALUATION

In this part the whole course is being evaluated. Completed sheets can give feedback and directions on further developments for educators.

### *1. Unfinished sentence*

Educator asks participants to finish the sentences concerning the blocks in the course.

*Table 4.11.3. Unfinished sentences for evaluation*

---

The most interesting part of the course was ...

The most useful part of the course was ...

The least useful part of the course was ...

One thing I would do differently ...

Any other comments ...

---

### *2. How do you agree with the statements?*

Every participants is given a sheet (see [Table 4.11.4](#)) then marks the sentences from 1 to 5 according to how they agree with the statements (1 – not at all, 5 – fully).

TRAINING PROGRAMME FOR TEACHERS' PROFESSIONAL DEVELOPMENT

*Table 4.11.4. Questionnaire for evaluation*

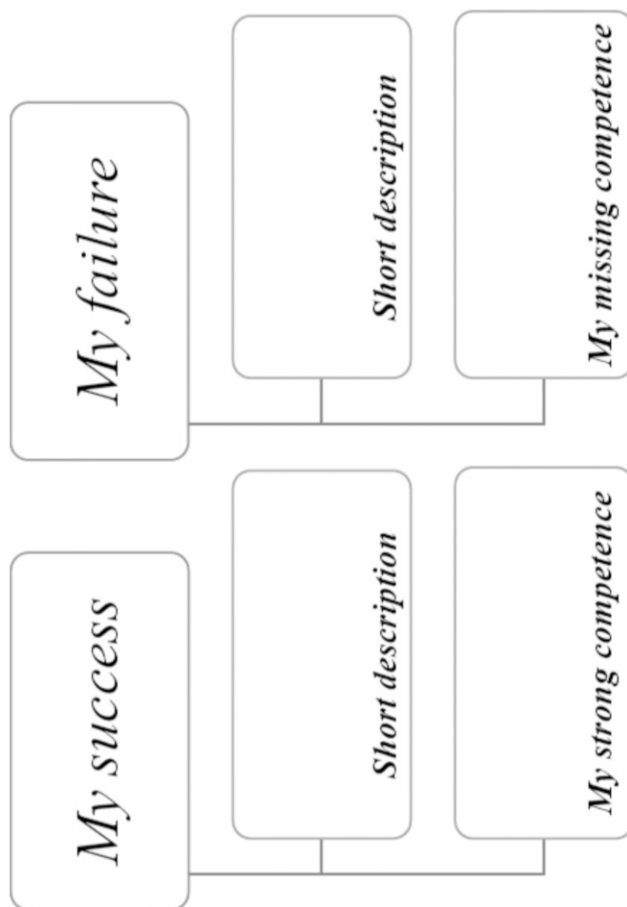
<i>The course has given contribution of...</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
a ...peer learning					
b ... improving knowledge of the problem solving process					
c ...providing techniques and methods of problem solving thinking					
d ... improving reflective thinking					
e ... harmonization of psychology and pedagogical aspects					
f ... bridging theory and practice in the teaching process					
g ... developing divergent thinking (collecting information and alternatives)					
h ... developing convergent thinking (selecting and making choices)					
i ... developing own pedagogical strategies					
j ...					

*3. Final discussion*

To conclude the course, the facilitator can initiate a final discussion in which participants can share their opinions with the whole group.

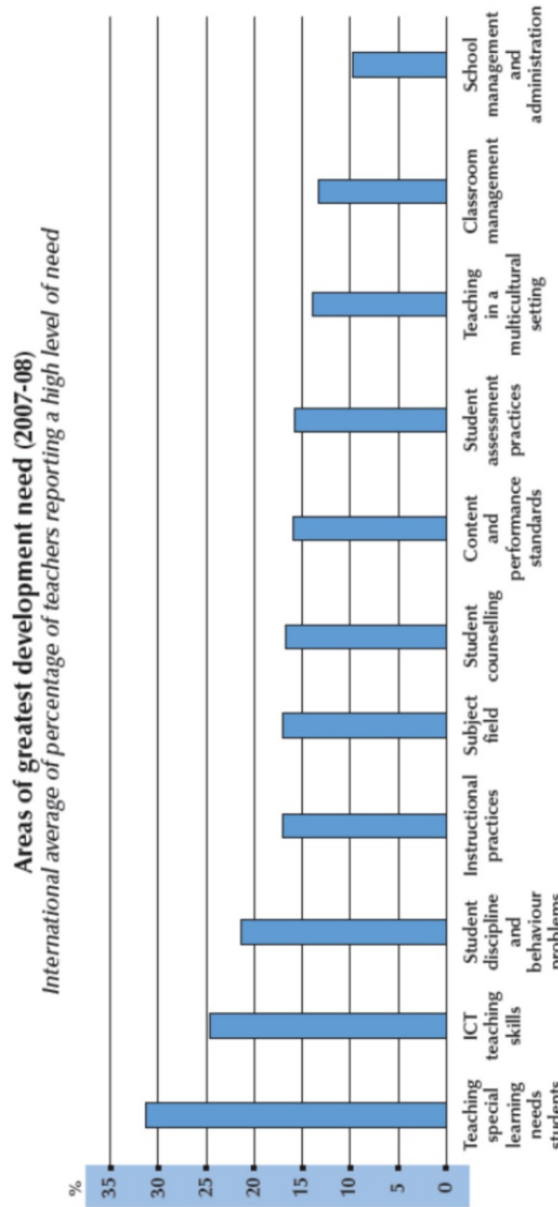
## APPENDIX

Teacher as ...	_____
... a lifelong learner:	_____
... a subject matter specialist:	_____
... a member of a school team:	_____
... a social agent:	_____
... a member of the educational community:	_____
... an organizer:	_____
... a classroom actor:	_____
... a tutor:	_____
... culture participant:	_____
... researcher:	_____
... leader:	_____
... facilitator:	_____






<i>Competence</i>	<i>Rank</i>
Content and performance standards Student assessment practices Classroom management Subject field ICT teaching skills Teaching special learning needs students Student discipline and behaviour problems School management and administration Teaching in a multicultural setting Student counselling Teaching in a multicultural setting Instructional practices	

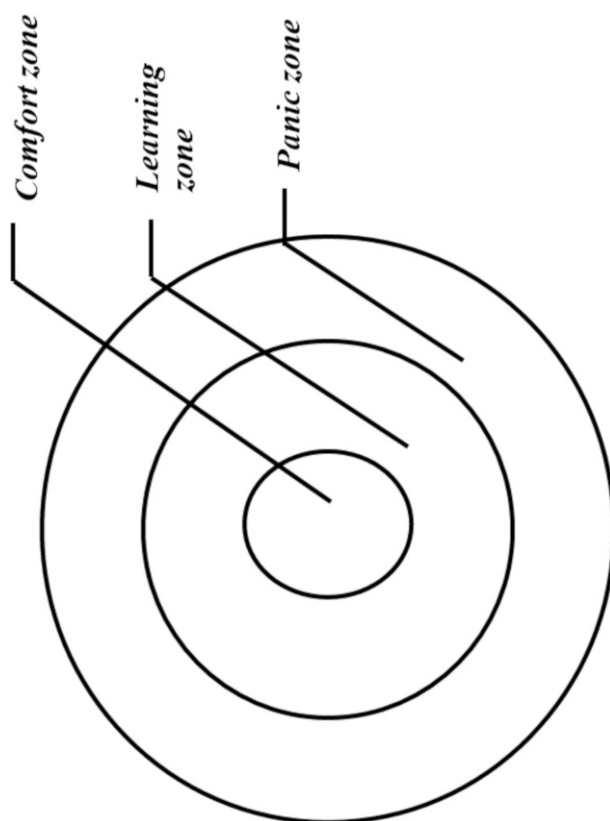


Areas are ranked in descending order of the international average where teachers report a high level of need for development.

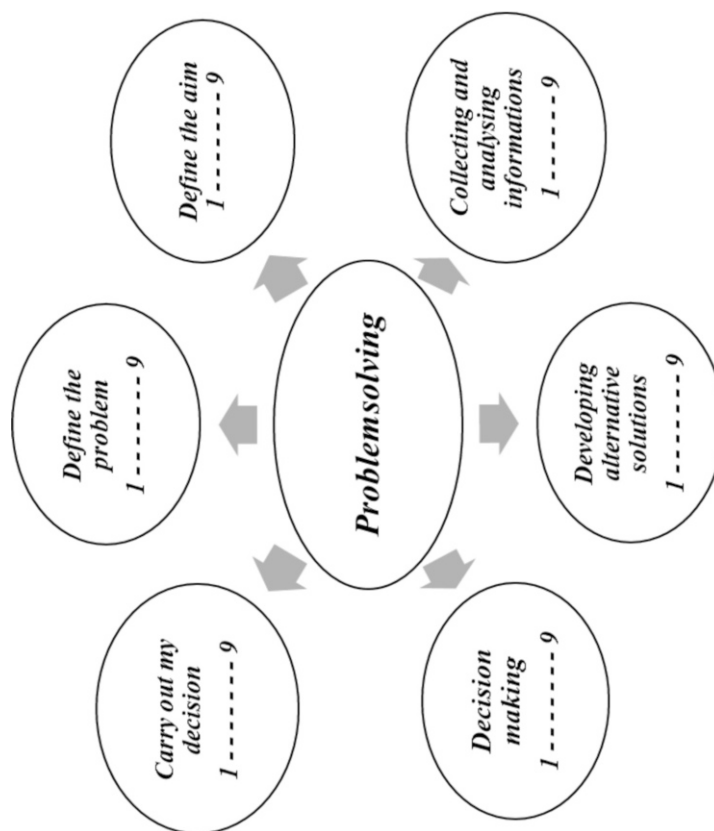
Source: OECD, Table 3.4.

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<i>Situations</i>	<i>Score</i>
<ol style="list-style-type: none"><li>1. Someone jumps in front of you in a queue.</li><li>2. You lose your house key.</li><li>3. You are late because someone kept holding you up.</li><li>4. You overhear someone criticising your work.</li><li>5. You are stuck in the traffic jam and you need to get home.</li><li>6. You express your opinion and someone laughs and tells you not to be ridiculous.</li><li>7. You are asleep and are awakened by loud music from next door.</li><li>8. You are accused of something you have not done.</li></ol>	



- A) “Complex problem solving implies the efficient interaction between a solver and the situational requirements of the task, and involves a solver’s cognitive, emotional, personal, and social abilities and knowledge.” (Funke & Frensch, 1995: 18)
- B) During the problem solving process the given situation is transformed into the desired situation. (Hayes, 1981).
- C) “If a detailed strategy is already known for reaching the goal, no problem solving is required.” (Wilson & Keil, 2001: 674)
- D) “Problem solving is defined as the self-directed cognitive-behavioral process by which an individual, couple, or group attempts to identify or discover effective solutions for specific problems encountered in everyday living. More specifically, this cognitive-behavioral process (a) makes available a variety of potentially effective solutions for a particular problem and (b) increases the probability of selecting the most effective solution from among the various alternatives.” (D’Zurilla & Nezu, 1982:12)
- E) “We view problem solving as a healthy, normal, and creative process in which capable practitioners attempt to make sense of puzzling or challenging phenomena, identify areas of practice that bear scrutiny, define particular goals for improvement, and pursue actions explicitly intended to accomplish them.” (Copeland, Birmingham, De La Cruz, & Lewin 1993: 348)

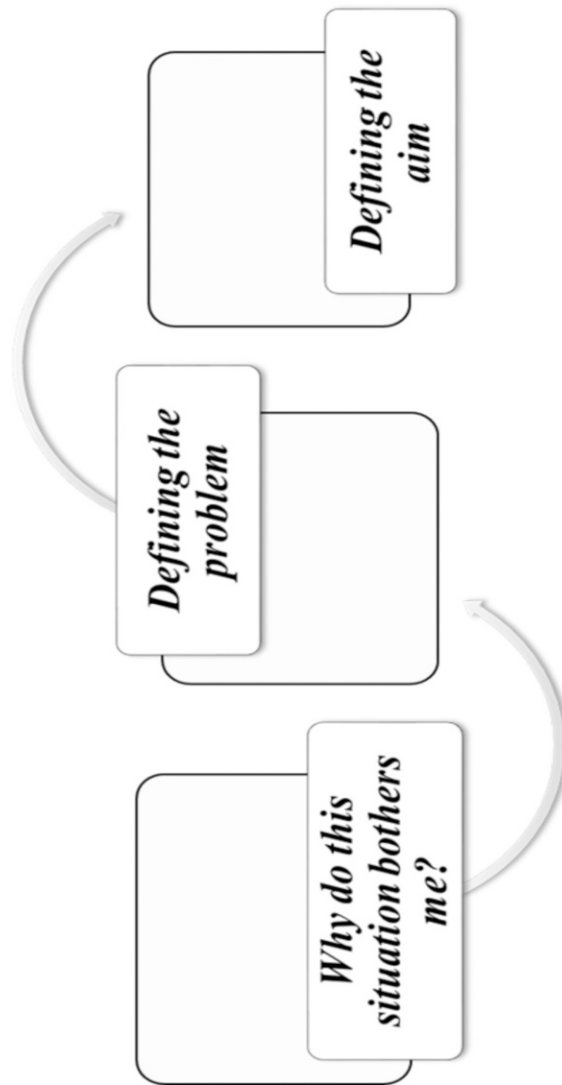


<i>What does it mean to you ... ?</i>	
... to be late a bit: _____	? (How many minutes?)
... to sleep a lot: _____	? (How many hours?)
... to get up early: _____	? (When?)
... to have a lot of friends: _____	? (How many people?)

APPENDIX

<i>Why does this situation frustrate me?</i>	1.
	2.
	3.





APPENDIX



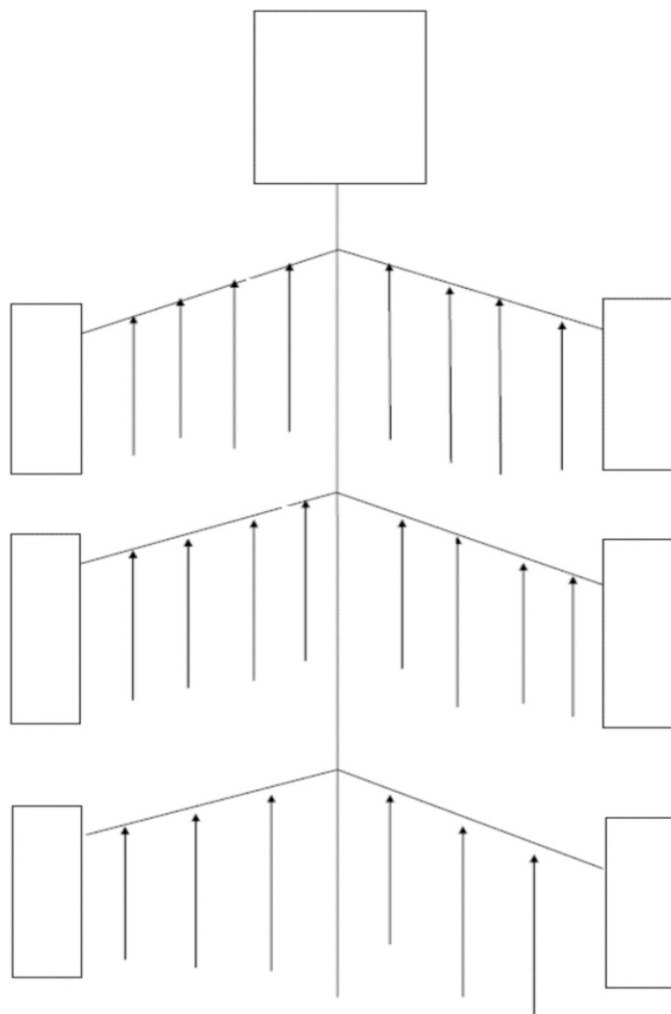
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<i>Who? (3.)</i>	<ul style="list-style-type: none"><li>• Her/his needs:</li><li>• Her/his anxieties:</li></ul>
------------------	---

<i>Who? (2.)</i>	<ul style="list-style-type: none"><li>• Her/his needs:</li><li>• Her/his anxieties:</li></ul>
------------------	---

<i>Who? (1.)</i>	<ul style="list-style-type: none"><li>• Her/his needs:</li><li>• Her/his anxieties:</li></ul>
------------------	---

APPENDIX



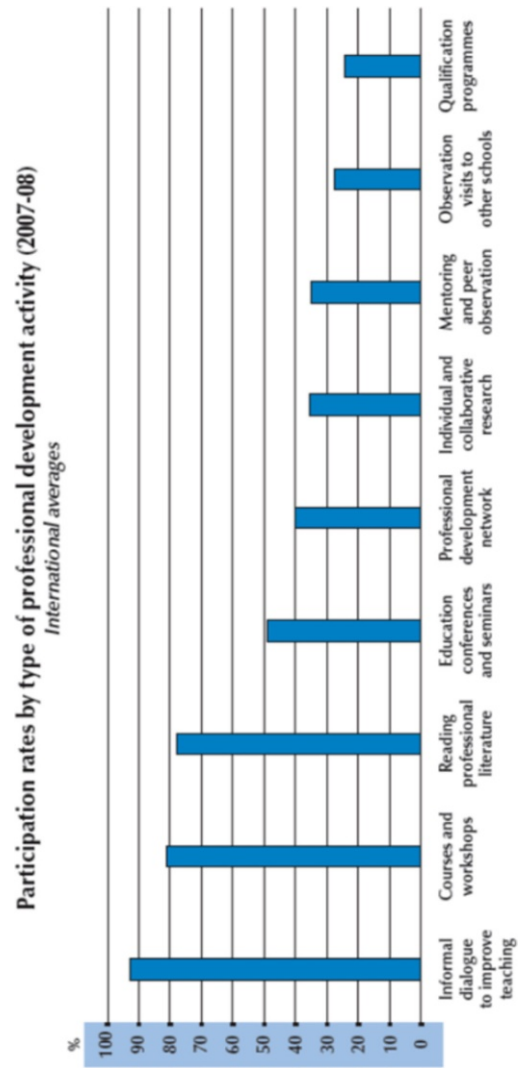
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Objective information		
Fact	The fact I know ....	From where and from who do I collect these information?
Clarified issues	What I do not know ....	What kind of information do I need?

APPENDIX

Subjective information			
	Involved person ...	His/her feeling	Why do I think it?
Feelings, emotions			
Opinion, assumption, impression	Who? ...	What does he or she think?	How do I know it?

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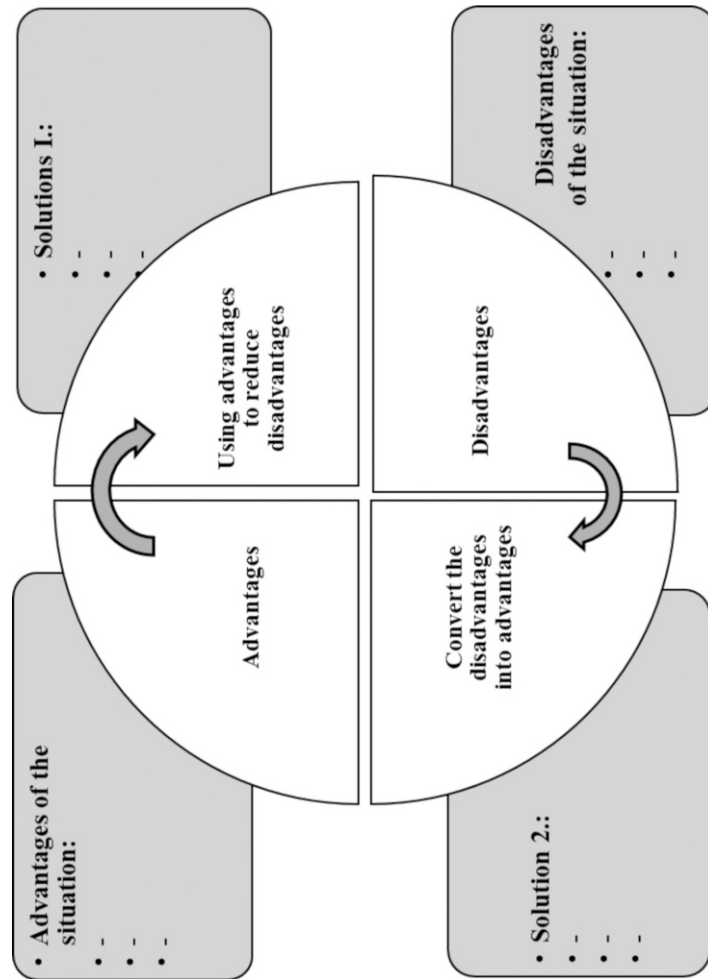
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APPENDIX

<i>Activities</i>	<i>Comments</i>
<p>to make an individual development plan</p> <p>to do research (action research, case study, lesson study etc.) about my own practice</p> <p>to do journal writing (or diary)</p> <p>to do reflective practice by audio or video recording of a lesson</p> <p>to collect feedback from students, parents, colleagues etc.</p> <p>to read books, journals and articles and search out more sources</p> <p>to have a mentor, coach or a critical friend</p> <p>to take part in school training using the expertise available within the school</p> <p>shadowing: observe a fellow teacher/experienced colleagues in the same setting</p> <p>shadowing: observe a fellow teacher/experienced colleagues in different setting</p> <p>to take part in peer lesson observation</p> <p>to try exchange or replacement with another teacher, school</p> <p>to take part in collaborative planning or in good practice</p> <p>to be involved in a school project</p> <p>to organise meetings and discussions with teacher on different level and from different school in a topic of common challenge</p> <p>to organize peer group discussion in the school</p> <p>to invite a specialist into the school</p> <p>to create specialist forum groups</p> <p>to have supervision</p> <p>to take part in team teaching</p> <p>Other:</p>	

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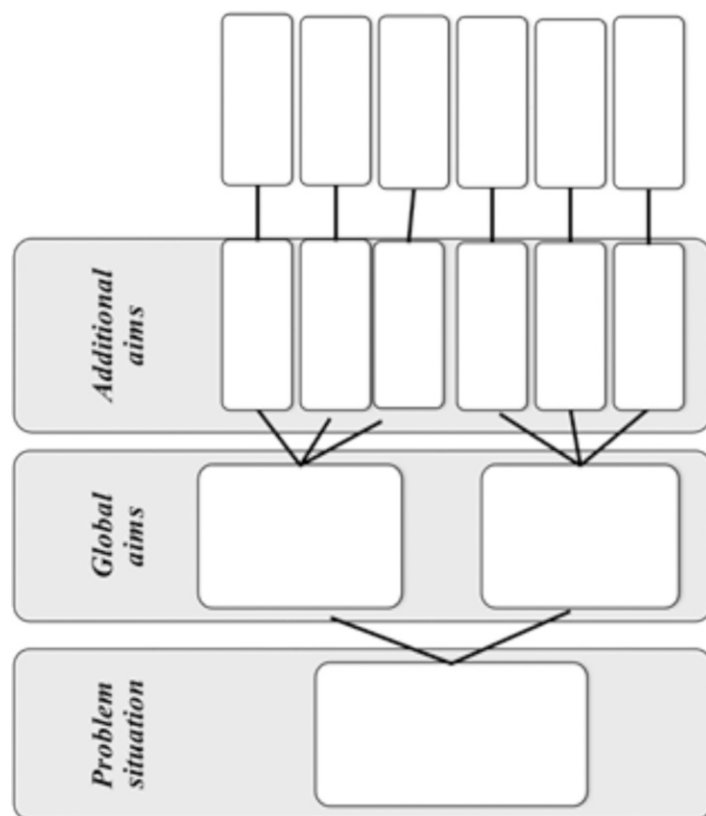




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APPENDIX

- a) Creativity is seeing what everyone, else has seen, and thinking what no one else has thought. (Albert Einstein)
- b) All human development, no matter what form it takes, must be outside, the rules; otherwise we would never have, anything new. (Charles Kettering)
- c) Every act of creation is first of all an act of destruction. (Pablo Picasso)
- d) There is no doubt that creativity is the most important human resource of all.
- e) Without creativity, there would be no progress, and we would be forever repeating the same patterns. (Edward de Bono)
- f) All great deeds and all great thoughts have a ridiculous beginning. (Albert Camus)
- g) I can't understand why people are frightened of new ideas. I'm frightened of the old ones. (John Cage)
- h) The difficulty lies not so much in developing new ideas as in escaping from old ones. (John Maynard Keynes)
- i) We can't solve problems by using the same kind of thinking we used when we created them. (Albert Einstein)

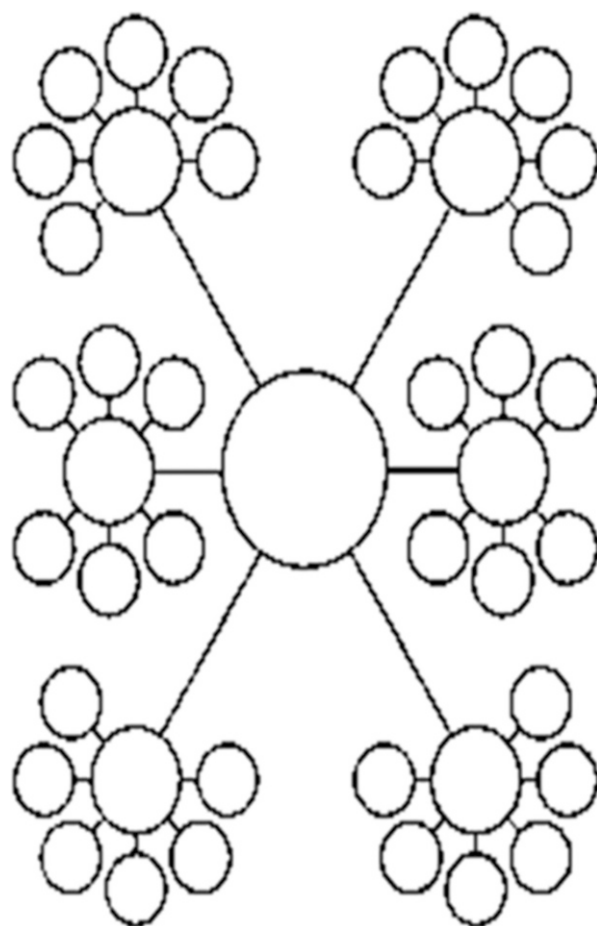


APPENDIX

<i>Cognitive process</i>	<i>Helpful questions</i>	<i>Own ideas</i>
Substitute	What will happen if I change, the, materials, the involved persons, methods, environment, feelings or the, process of the situation in my thought?	
Combine	What kind of new ideas turn up if I mix some parts of the situation in my thought?	
Adapt	Do I know any similar situation context, materials etc. I can use for creating my solution?	
Modify	Are there, any new ideas turning up when I extend or decrease, some components of the situation in my mind?	
Put to another use	What will happen if I use, a material, tool, method completely differently than before?	
Eliminate	What are the least important factors of the situation? What happens if I eliminate some features, parts or factors of the situation?	
Rearrange	What will happen if I turn the situation upside, down in my mind or if I move, from the end to the beginning of the situation? What will happen if I reorganize the main component of the situation?	

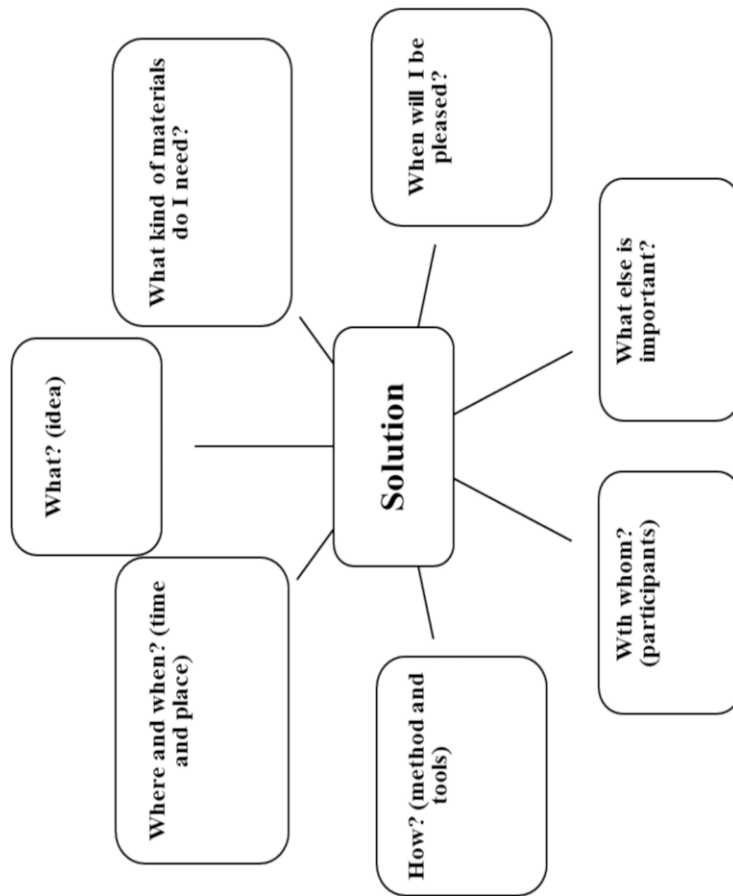
<i>Statement</i>	<i>During interactive (teaching) phase</i>	<i>During planning phase</i>
I make a decision rather consciously		
I make a decision rather intuitively and spontaneously		
I use techniques for decision making		
I take my time to choose the best solution		
I analyse the situation before making a decision		
I collect as much information as possible before decision making		
I rank the alternatives before my choice		
I count on the risk factors of my decision		
I ask for advice before I choose between the alternatives		
I have huge routine		
I consider every possible effect of the alternative options		
I evaluate my decisions after the lessons		
I usually make proper decisions		

APPENDIX

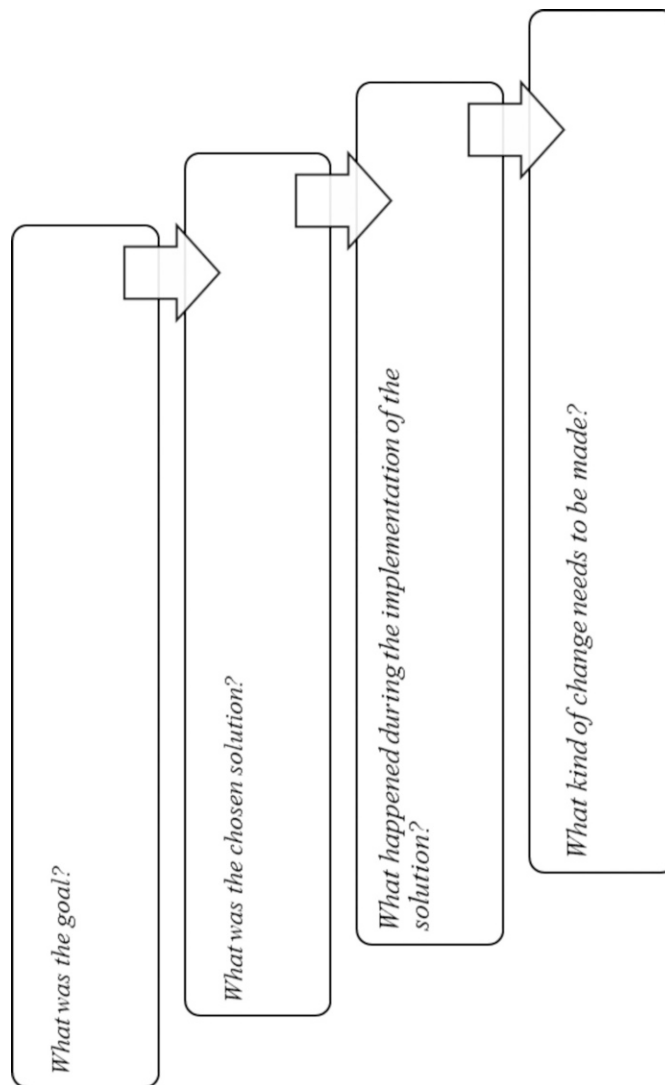


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<i>Steps of problem solving process</i>	<i>Useful tools and methods</i>	<i>Comments</i>
Problem and goal setting		
Collecting information		
Developing alternatives		
Decision making		







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