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## Autorefleksja i kompetencje psychodydaktyczne nauczyciela akademickiego przedmiotów technicznych

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## SELF-REFLECTION AND PSYCHO-DIDACTIC COMPETENCE OF A UNIVERSITY TEACHER OF TECHNICAL SUBJECTS

### Abstract

Undoubtedly, the essential pedagogic skills of a university teacher of technical subjects include high erudition in the field of didactic competences and regular self-reflection. For a teacher, that means existence of adequate level of knowledge and experience in the field of education theory, work including feedback and self-reflection. Self-reflection and didactic competence are closely interconnected, they are blended together. To be specific this means that awareness of progress of last education, its optimum and less successful parts, facilitates the teacher to plan future education, even with more efficient use of teaching resources. The interconnection of psycho-didactic competence and pedagogic self-reflection may be regarded as inseparable parts of pedagogic activities, which the teacher must do regularly if s/he wants to make his/her education in good quality.

### AUTOREFLEKSJA I KOMPETENCJE PSYCHODYDAKTYCZNE NAUCZYCIELA AKADEMICKIEGO PRZEDMIOTÓW TECHNICZNYCH

### Streszczenie

Bez wątpienia, niezbędne umiejętności pedagogiczne nauczyciela akademickiego przedmiotów technicznych obejmują wysoką erudycję w zakresie kompetencji dydaktycznych i regularną autorefleksję. Dla nauczyciela, oznacza to istnienie odpowiedniego poziomu wiedzy i doświadczenia w dziedzinie teorii edukacji, pracy, w tym opinii i autorefleksji. Autorefleksja i kompetencje dydaktyczne są ze sobą ściśle powiązane, harmonizują ze sobą. Bycie znaczącym oznacza, świadomość postępu edukacji, jego poziomu optymalnego i mniej udanych obszarów, ułatwia to nauczycielowi planowanie przyszłego kształcenia, a nawet bardziej efektywne wykorzystanie zasobów dydaktycznych. Połączenie kompetencji psychodydaktycznych i pedagogicznej autorefleksji może być uznane jako nieodłączna część działań pedagogicznych, które nauczyciel musi wykonywać regularnie, jeśli on/ona chce, aby jego kształcenie było dobrej jakości.

### Introduction

A university teacher of technical subjects realizes education at university which, as Mužík says (2004), is a place where pedagogy meets andragogy. Profile of a graduate of a technical university is specified firmly; however, use of teaching methods and technical educational

resources depend rather on autonomous decision made by the university teacher. S/he is expected to integrate educational methods for adults into the traditional school methods, too, and to search, find and support common attributes of teaching university students and adults within the education. The requirement for adequate level of his/her psycho-didactic competence is also implied by the fact that besides teaching students, s/he also performs education for adults who execute their jobs while educating themselves further via distance learning. This fact is also an argument for the claim that knowledge, skills and experience included in the category of psycho-didactic competence are the necessary prerequisites for university education of good quality.

### **1. Psycho-Didactic Competence of a University Teacher of Technical Subjects**

Psycho-didactic competence is characterized as skills of a teacher which allow him/her to perform pedagogic activities efficiently, e.g. to activate and motivate those being educated, direct the educational process as well as the learning process of the participants of education, to make adequate use of teaching resources, to take individual teaching styles into account. In other words: a teacher should make efficient and attractive use of didactic educational resources, which in the broadest sense include everything what help achieve the educational objectives. To be specific, this means selection of curriculum, organization of education, teaching forms, principles, methods and technical teaching resources, while technical teaching resources cover teaching aids and didactic technique performing the mediating function between the university teacher and the students by helping the teacher demonstrate the curriculum in a clear way, and by facilitating the students to acquire the desired information, knowledge, skills and habits efficiently.

When choosing the teaching resources, a university teacher of technical subjects should make provisions for psychological differences between the students and the adult participants of the education. Within education of adults, s/he should accentuate more strongly individual approach, activity, interaction and participation based on resolving of real issues. The adults should be allowed to affect the objectives, curriculum, forms and methods of education in some extent, as they are used to manage themselves, make decisions, act independently and be responsible for their actions. As far as interest in learning is concerned, they are motivated when the teacher notifies them of immediate success, which will be brought by the knowledge and skills acquired through studying the specific issue. Pisoňová (2012) says that application of the differentiated approach to students requires teacher's deeper knowledge in the field of

personality psychology, developmental psychology, educational psychology and of other branches and disciplines of science.

Teaching of technical subjects has also its own specifics. This especially means that the individual thematic issues in the scientific fields of technology are interconnected. Appropriate up-to-date knowledge of the students and optimum guidance of education executed by a competent teacher are the prerequisite for successful studies. Any deficiencies in quantity or quality of their knowledge might be brought already from high school and these might be deepened further during university studies. In case of more and more increasing gap between the quantity of knowledge which the students should have and that which the student actually have, acquisition of further special technical information is made more difficult for them and pedagogic activity of the teacher becomes inefficient. Knowledge of the adult participants might be also affected negatively by duration of the period which they spent outside the school environment, as they might have forgotten the knowledge acquired before. So, the current knowledge and skills of the students should be checked even before starting the education. Only after that the new curriculum could be demonstrated in an easy-to-understand way. Without proper understanding of the curriculum it is not possible to exercise that in practice, or to assign homework for the students, while independent work of good quality has a positive impact on the long-term studying success.

Weltner (1994) means that insufficient studying performance results in further deficiencies in knowledge which cause insufficient educational progress. He is convinced that a lecture held in some technical subject may be regarded as continual explanation of individual terms, thoughts, correlations between the terms, rules, regularities and theories, while number of terms which the students shall remember is huge. An ideally guided education would be that one during which the students would learn all the terms presented, which is not possible as they deviate from that value more or less. So, full acquisition of knowledge does not occur during education and due to that fact learning deficiencies of individual's increase, which impact subjective difficulty in understanding of further subject matters in the following time teaching units. If quantity of original unfamiliarity increases further for some students, then acquisition of further knowledge is disrupted, educational progress decreases and deficiencies in their knowledge increase progressively. So, during teaching of technical subjects it is desirable to repeat already-known terms and add new terms to them. Frequent repetition and conjunction of new information and the already-learned knowledge make more solid structure of knowledge, which affects positively duration of the matters learnt. At the same time the repetition is split in shorter periods of time which increases probability of the fact that individual status of knowledge does not fall below the value which the student wished to reach.

A university teacher should guide the education while being conscious that each participant, no matter whether s/he is a student or an adult, prefers a different way of acquisition, sorting, and storing of new information while learning. Learning styles are invariable, they can be affected, influenced and changed from outside; however, a teacher should realize such external interventions carefully to allow the students performing activity and auto-regulation (Schneiderová, 2007). Kolb (1976) means that a student may use multiple styles when learning; however, s/he usually prefers one. Based on the learning style preferred he classifies the individuals in four categories, and he speaks about „a dynamic”, „an innovator”, „an analyst” and „a practitioner”. Characteristics of each learning styles and their carriers can be seen in the figure 1.

<p><b>ACCOMMODATION STYLE</b>  <b>feel and do!</b>  <b>a dynamic</b>  <b>immediate response</b>  <b>quick adaptability</b>  <b>can modify plans, theory</b>  <b>new opportunities, risk</b></p>	<p><b>DIVERGENT STYLE</b>  <b>feel and watch!</b>  <b>an innovator</b>  <b>imagination</b>  <b>awareness of meaning and values</b>  <b>correlation in a whole</b>  <b>prefers interest in people</b></p>
<p><b>CONVERGENT STYLE</b>  <b>think and do!</b>  <b>a practitioner</b>  <b>conventional IQ tests</b>  <b>one solution, answer</b>  <b>deductive thinking</b>  <b>prefers technical tasks</b></p>	<p><b>ASSIMILATION STYLE</b>  <b>think and watch!</b>  <b>an analyst</b>  <b>combine different observations in one whole</b>  <b>intuitive solution, often incorrect</b>  <b>search for solution at other people rather than analyzing by himself/herself</b>  <b>prefers interest in ideas and abstract theories</b></p>

Fig. 1. Presentation of learning styles according to Kolb (1976)

Efficient learning of all the participants occurs when the teacher takes all the four learning styles into account and based on them s/he uses the didactic cycles below within education (fig. 2).

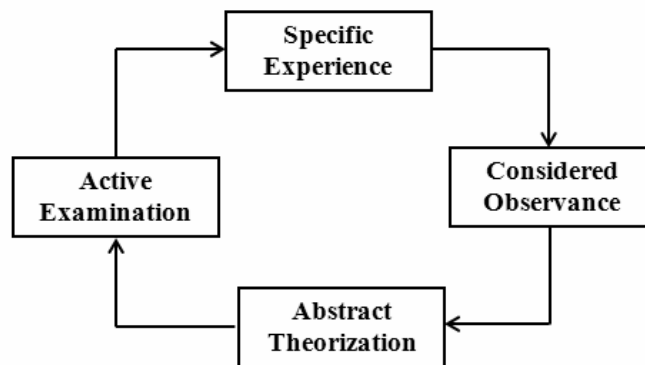


Fig. 2. Teaching cycle according to Kolb (1976)

Thorough implementation of didactic cycles into education requires a university teacher of technical subjects to execute didactic analysis of curriculum regularly. To be specific this means specification of educational objective, planning didactic cycles and selection of optimum teaching resources. Among other, the prerequisite for a quality-executed didactic analysis is teacher's self-reflection performed systematically and in the long-term.

## 2. Pedagogic Self-Reflection of a University Teacher of Technical Subjects

Content of the term of „self-reflection” has not been defined clearly, it varies depending on the approach of each discipline of science. The ability of self-reflection (conscious self-knowledge, self-definition, self-evaluation) is considered to be characteristics of a person pointing out to the extent of his/her personal maturity (Výrost, Slaměník 1997). Průcha, Walterová, Mareš (2003) characterize „self-reflection” as contemplation of an individual about himself/herself, looking back at his/her actions, ideas, attitudes, feelings, recapitulation of a certain segment of his/her own life or behaviour and decisions in situations, while this includes actions and situations that are important for that person. The objective of self-reflection is to carry out evaluation of oneself, based on that to make a decision of what to change and how to change that, and then to plan a revised progress further. Kalhous, Obst (2002) regard self-reflection in pedagogic activity as the teacher's ability to be aware of his/her own knowledge, experience and feelings of the pedagogic activity, especially of resolving pedagogic situations. During that process, his/her own pedagogic knowledge and experience are described, analyzed, evaluated, arranged and generalised.

Pedagogic activity of a university teacher of technical subjects may be characterized as a process, which s/he plans based on the analysis of hi/her previous impact on students. A teacher who can use self-reflection to improve university education is typical in a certain way of pedagogic action. Hupková says (2006) that s/he focus on students and pay enough attention to their needs, carefully plans educational process, plays the role of a facilitator, can work with feedback and requires to obtain that from students, can apply strategic thinking and educates himself/herself further.

Self-reflection is connected to reflection, while reflection means awareness of one's own situation and position compared to how the others see us. Self-reflection then allows us to see what reflection makes of us and what it means for us (Švec, 1999). Průcha says (2003) that professional self-reflection is a prerequisite for teacher's professional growth, as it brings him/her impulses for improvement of pedagogical activities. When a university teacher of technical subjects 'projects' his/her teaching day in his/her mind, including pedagogic experience, s/he can also think about the methods s/he chose, assess their efficiency critically and based on them develop models of future possible situations, including their solutions. For thinking about his/her own work, the teacher needs personal maturity, serious effort to perform pedagogic activity as good as possible and certain extent of creativity. Furthermore, teacher's creativity releases creativity of students and impacts positively not just their creativity, but progress of the entire education, as well (Honzíková, 2008).

The knowledge, which a teacher deduces from the self-reflection performed, allows him/her to avoid complicated pedagogic situation by having prepared their possible solutions, to verify efficiency of the teaching resources chosen, to adjust harmony between the material and non-material resources chosen, to increase professionalism in selection of teaching resources, i.e. to improve himself/herself within all the psycho-didactic competence. So, the importance of pedagogic self-reflection for the level of psycho-didactic competence is absolutely obvious.

## **Conclusion**

Knowledge, skills and experience, which positively impact the level of psycho-didactic competence, are acquired continually by a university teacher of technical subjects; these are acquired through studying the relevant issue, practical use of knowledge within the actual university education and through regular realization of pedagogic self-reflection. An important role is also played by the level of his/her knowledge and skills in the field of general and developmental psychology, personality psychology, adult psychology, social psychology, adult pedagogy, branch didactics, etc. The level of psycho-didactic competence is also affected by his/her personality properties (e.g. by optimism, sense of humour), enthusiasm for experi-

ments and desire for finding new teaching resources which would make university education more attractive, by efforts to work on himself/herself for his/her whole life and educate himself/herself. As we wrote above, none of those activities, if it is to be improved in the future, can be made without looking back and evaluating its progress. In this aspect, the importance of self-reflection cannot be substituted.

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