

Transdisciplinary approach in elaboration of Learning materials in the sphere of Management

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ABSTRACT This paper examines the peculiarities and principles of elaboration of teaching materials which re-orient studies in the sphere of management sciences to learning outcomes and are based on the transdisciplinary approach. The main results of the research are related to reorientation of study process to learning outcomes in the sphere of management sciences, as well as to determination of elaboration principles of elaboration of teaching materials based on the transdisciplinary approach. The main conclusion of the research: as the educational paradigm orients to sustainability, emphasising transdisciplinarity and development of student's personality, the principles of elaborating teaching materials in management sphere are as follow: perception of human and society in its united wholeness, promotion of reflection and activity, development of a creative personality, transforming teaching materials according to student's individual peculiarities (learning style, functioning of the hemispheres of the brain, etc.), knowledge and experience as personal construct.

Keywords: Transdisciplinary approach, Management, Learning Material

Introduction

The emergence of a new culture, capable of contributing to the elimination of the tensions menacing life on our planet, will be impossible without a new type of education, which takes into account all the dimensions of the human being. All the various tensions - economic, cultural and spiritual - are inevitably perpetuated and deepened by a system of education founded on the values of another century, and by a rapidly accelerating imbalance between contemporary social structures and the changes that are taking place in the contemporary world (Nicolescu, 1999).

Ever more often in European countries the aims of education system are being updated; obtainable qualifications are being formulated and described, by emphasising learning outcomes. Thus the orientation on learning outcomes is related to the transition to adjustment of study content to individual needs of a student, by improving link with labour market and by developing the procedure of recognizing learning outcomes acquired through informal and everyday education. That all demands expansion of functions of contemporary teaching materials, as they are used not only for obtaining information, but mostly for developing eight basic-competences formulated by European Commission in 2006 (European Commission, 2006).

Educational scholars from a variety of disciplines consistently advocate for the use of experience-based or student-centred approaches as a way to engage students in

material and thereby enrich learning (Kolb, 1984; Hertel & Millis, 2002; McKeachie, 2002). In general, fostering student engagement through the use of activity-based learning materials is a viable tool for acquisition and can have multiple benefits for comprehension, retention, and interest in learning process (Krain & Shadle, 2006; Lean, Moizer, Towler & Abbey, 2006; Michael, 2007).

The substantial meaning of teaching materials in the study process is being updated in international conferences of IARTEM (International Association for Research on Textbook and Educational Media), which are devoted to the content of teaching materials, as well as to education media, and are based on elaboration of transforming teaching materials which ensure that work with them a) provides students with the possibility to transform (adjust) teaching materials, as well as to choose and transform teaching tasks; b) ensures recurrent feedback between the users of the teaching materials and assessors (Meisalo, 2003).

When a learning material is being elaborated in the sphere of management the following aspects of developing a modern manager should be taken into account:

- a) in 21st century in the foreground of skills to be developed in managers the following should be put forward: critical thinking, self-regulation, ability to solve problems in a creative way, team work skills and skills to create innovations, ability to substantiate and make decisions and to know modern technologies (WISE Summit „Reinventing Education for Life”, 2003);
- b) transdisciplinary approach becomes the “tool” with the help of which it is possible to co-ordinate the purposes and tasks of development of the society with the purposes and tasks of development of the ambient world.

This research studies the peculiarities and principles of elaboration of learning materials which re-orient studies in the sphere of management to learning outcomes and are based on the transdisciplinary approach in management science.

Methodology

In this research, the authors employed:

- a) the method of analyzing the European and world normative documents and theoretical conceptions, and as a result the authors formulate learning outcomes in the sphere of management sciences, which are based on the transdisciplinary approach;
- b) the method of generalizing theories, the European and world normative documents, as well as experience of the authors of this research in the light of the transdisciplinary approach for working out the principles of transforming study programs and educational materials.

Learning Outcomes in Study programs of Management from Point of View of the Transdisciplinary Approach

The European Qualifications Framework (EQF) of the European Higher Education Area and European Credit system for Vocational Education and Training (ECVET) has increased the importance of learning outcomes (European Commission, 2014), which can be considered as accelerators for national reforms. Thus to the approach of learning outcomes have been pinned greater hopes than ever before, and many per-

ceive this transition as the possibility to adapt education to individual needs, to enhance the link with labour market and to develop the procedure of recognizing learning outcomes acquired through informal and everyday education. The basic competences by EU are subdivided into *a) cognitive competences*, which are measured at national and international level; *b) competences, which require cross-curricular organisation at the highest degree* (digital competence, learning to learn, social and civic competence); *c) transversal competences*, for example, critical thinking, creativity, initiative, problem solving, risk assessment, decision taking, and constructive management of feelings. It assigns the main role to learning outcomes by redefining qualification rewarding and professional, general and higher education programmes, including in the Management Science, which is one of the newest branches of science, which has been recently singled out from the economic science as an independent branch of science.

The aim of different level study programmes in the sphere of management sciences is to ensure studies based on several sciences, after the acquisition of which the students would be able to validly realise sustainable management of the state, municipality and different kinds of enterprises, both at local, and international level, as well as to enhance the development of the mentioned science in Latvia. In the objectives of programmes in this direction the development of intellectual, professional, academic and practical competences of a manager are emphasised.

In the Report to UNESCO of the International Commission on Education for the 21st Century (1996) Jacques Delors strongly emphasises four pillars of a new kind of education: learning to know, learning to do, learning to live together with, and learning to be. In this context, the transdisciplinary approach can make an important contribution to the advent of this new type of education.

Learning to know means the being capable of establishing bridges between the different disciplines. According to Nicolescu (1999), transdisciplinary approach is an indispensable complement to the disciplinary approach, because it means the emergence of continually connected beings, who are able to adapt themselves to the changing exigencies of professional life, and who are endowed with a permanent flexibility, which is always oriented towards the actualisation of their interior potentialities. In this context a manager:

- has to be aware that the sustainable development conception is the basis for society and institution management;
- has to be able to demonstrate in-depth knowledge and critical awareness about management theories, their evolutionary development, by demonstrating originality and scientific approach to solving management issues;
- has to have a good knowledge of laws and regulations of society management and the principles of institutional system, company (institution) administrative management;
- has to conceive the interrelation and diversity of management and its basic functions (planning, organising, keeping personnel records, motivation and control);
- has to demonstrate in-depth knowledge in issues related to personnel, production/services, management information systems, marketing, financial management, economics, labour relations and safety arrangement and precautions;
- has to have a good knowledge of management quality assessment methods;
- has to have a good knowledge of methods of mathematical analysis of data and knows how to obtain information necessary for management of society and

- institutions with scientific methods appropriate for management science and by critically evaluating own actions accordingly to concrete situations.

Learning to do certainly means discovering novelty, creating, bringing to light our creative potentialities, as well as the acquiring a profession through a phase of specialization: “Excessive specialization should be outlawed in a world that is in rapid change. If one truly wants to reconcile the exigency of competition and the concern for the equal opportunity for all human beings, in the future, every profession should be an authentically woven occupation, an occupation which would bind together in the interior of human beings threads linking them to other occupations” (Nicolescu, 1999, 5). It means that for a modern manager it is important:

- to integrate cognitions of different management theories, contribute to creation of new knowledge, research and usage of scientific methods;
- to demonstrate adaptation to new situations, openness to changes and readiness to act in unexpected and changing conditions;
- to create favourable conditions for innovations and ability to adapt in the rapidly changing world;
- to organise management quality control, carry out analysis of the achieved results, prepare reports, foresee and model future situations, by using the special information technology products;
- to demonstrate critical comprehension and respectful attitude about the diversity of management context and social justice as the basic element of sustainable development of management and human prosperity, and to demonstrate ability to update it;
- to design and implement projects promoting development of society and institution management;
- to prepare and provide society with information related to activity of institutions and organisation;
- to plan and organise one’s own and structural unit’s activity.

To live together with means the transcultural, transreligious, transpolitical and transnational attitude can be learned. These kinds of attitude permits people a) to better understand their own culture, b) to better defend their national interests, c) to better respect their own religious or political convictions (Nicolescu, 1999). Due to that a manager:

- has to gather information about his/her own culture and spiritual identity and belonging to a state, to demonstrate critical understanding and purposeful action, in order to become an informed, active and responsible citizen and professional manager of an institution;
- has to identify and structure problems corresponding to the society, understand interrelations between the economic, social and culture environments;
- has to enhance openness to culture diversity and promote communication between cultures;
- has to be able to substantiate and discuss about complex aspects of management theories both with specialists, and with non-specialists;
- has to be able to demonstrate critical understanding about the links between a man, geographical place, process and environment in the sphere of management and the effect of local actions and events on society and institution management at local and global level;

- should induce workers' aesthetic perception, emotional development, creative thinking and intuition.

Learning to be means the discovering conditioning, discovering the harmony or disharmony between individual and social life, testing the foundations of convictions in order to discover that which is found underneath (Nicolescu, 1999). In this context a manager:

- has to show an aesthetic position of his/her actions in the possible influences on the development of an organisation and society in general;
- has to demonstrate personal attitude towards local and global issues related to development possibilities and diversity of organisations and institutions;
- has to assume responsibility for his/her own contribution to decision making both with shared actions and their consequences;
- has to work in a team;
- has to followed rules of communicative culture and professional conduct;
- has to gather information on his/her own professional, cultural and spiritual identity;
- has to plan and promote his/her own professional development independently;
- has to carry out evaluation of his/her own professional activity.

It is important to show in the study process of management that the problems of society are increasingly complex and interdependent: they are not isolated to particular sectors or disciplines, and they are not predictable. According to Gureev & Moki (2013), the choice of a transdisciplinary research methodology is conditioned by two factors:

1. Information models proposed enable classification of events and activities by the criteria of their impact on the status of their object;
2. Temporal models proposed enable quantitative determination of the beginning dates of development periods, stages and cycles in the development of any objective considered as a system.

The above mentioned directs to changes in study process, including in elaboration of learning materials.

Peculiarities and Principles of Elaborating Learning Materials Based on the Transdisciplinary Approach

In terms of requirements to elaboration of learning materials, Leacock & Nesbit (2007) moot their quality dimensions: quality of the contents, compliance with the educational purpose, feedback and adjustment, motivation, design, interaction of usability, accessibility, recurrent applicability and compliance with standards.

When learning materials are being elaborated it is especially important to understand to what extend the relations between *information* and *knowledge* are explicit in the study process. It should be recognized that by elaborating learning materials oriented to learning, the "starting point" should be put on *information*, which includes perception, comprehension and recognition. It means change of thinking by using new ideas, ability to see the common and the different, what was known till now and what

is newly acquired, by determining personal systematic coherences. Furthermore, in this learning process the formation of knowledge is closely related to the practice and this orientation should be oriented towards several preconditions:

- usage of knowledge always leads to their formation and transformation;
- learning is always the integral aspect of every action, which forms links in the world and with the worlds;
- that what is being learned is always complex and problematic;
- knowledge acquisition is not simply taking in knowledge: this is things that have to accepted as natural categories, body of knowledge, people, who learn, culture transmission, and as such they require change of conceptions about culture and social results (Lave, 2009).

Such cognitions are especially important to specialists in the sphere of management, as especially in this sphere more than in others, the transition from “mass production” to education of qualified specialists, to special quality production, which is based on the basic competences formulated by the EU, is important. A significant aspect in the process of preparing management specialists is characterised by the fact that in management structures the constant changes are especially important, therefore the methods and techniques, which are used in the altering process of the whole system, should be acceptable to the people involved at their level of consciousness and world-views (Barrett, 2006). A simultaneous transition is taking place, in order to determine the general or transferable skills, which are required by the modern labour market, together with specific knowledge and skills. In any case, the challenge is to ensure that the learner acquires the transferable skills, which are necessary for unexpected situations of professional activity, as well as at the same time, the student has to acquire the technical skills necessary for labour market.

So that the manager could successfully manage the system alerting processes of the whole organisation, it is very important to clarify his/her level of consciousness and the established world-views, which determine his/her actions. Barrett (2006) distinguishes seven clearly defined stages in the development of consciousness as shown in Table 1.

Level	Motivation	Focus
7	Service	Leading a life of self-less service
6	Making a difference	Making a positive difference in the world
5	Internal cohesion	Finding personal meaning in existence
4	Transformation	Finding freedom by letting go of our fears about survival, feeling loved, and being respected by our peers
3	Self-esteem	Feeling a sense of personal self-worth
2	Relationship	Feeling safe, respected, and loved
1	Survival	Satisfying our physical needs

Table 1: The Seven Stages/Levels of Personal Consciousness (Barrett, 2006, 12)

The model of the seven stages of personal consciousness clearly outlines the necessity for managers to constantly change. In today's circumstances, when the changes of society persistently affect such peculiarities as fast pace of development, a huge amount of information, expressed need for additional education, fast enough aging of knowledge, different kinds of threats (ecology, terrorism, incurable disease, etc.), change of jobs, broadening of job description, etc., we have to be aware that, that constantly makes people refuse their previous way of thinking and behaviour, searching for new and more efficient solutions to the situations.

In preparing high level specialists, creativity could be one of the promoters of development of professional competences. In implementation of management study programmes especially corresponding is the structure of creativity formulated by Halpern & Coren (1999), which consists of sensitivity, synergy and intuition.

According to de Bono's (1999) opinion, creativity can be deliberately learned and it is possible to train it. It is obvious, that elaboration of new learning materials should be based on the cognitive factor of creativity. According to de Bono, lateral thinking is generation of totally new ideas: it produces new ideas. Creativity can develop in cooperation with the inspirer, mentor, lecturer, and it can happen also in later stages of development. In human resource management (Hennesey & Amabile, 1988) creativity is considered as one of the most important indexes of execution of work.

On the basis of the conclusion, that development of creativity is linked to the functioning of the right hemisphere of the brain (Eysenck, 1998; Raipulis, 2006) and for very creative people the functioning of the right hemisphere of the brain is dominant, the authors of the article consider that in elaboration of new learning materials one should be oriented to such materials, which stimulate also the functioning of the right hemisphere of the brain, not only the functioning of the left hemisphere of the brain (as it is usual in the process of traditional learning). As the hemispheres of the brain process information in accordance to the dominance activity of the hemisphere depending on the task to be done in perception, processing and understanding of the information, the learning materials should be elaborated as being diverse, with the focus on putting into action functioning of both hemispheres of the brain, so that by acquiring new information the student could integrate it in meaningful understanding of the world (Sousa, 2006). Thus the new learning materials should be such that with the help of them it would be possible to work with notions both verbally and visually, using also simple graphical drawings, for showing the correlations between notions; the notions should be considered both logically (by showing concrete facts and concrete conclusions), and intuitively, turning to actions provoking thinking (for example, by asking questions: "What can ... lead to?", "What could happen...?", "What would happen, if...?", etc.); the tasks to be evaluated should be foreseen for the specific of functioning of both hemispheres of the brain, by offering to choose different kinds of exercises. Smits (2000) asserts, that the dominance of the hemispheres of the brain determines also the dominance of perception (for 29% of people dominant is visual perception, 34% - audio perception, but 37% - kinaesthetic perception).

By elaborating new learning materials one should think also about the development of skills; in order to develop a skill and achieve higher results, it is necessary to observe four conditions:

1. The choice has to be made to develop skills (motivation should be strengthened);
2. Sufficient amount of knowledge is necessary, in order to understand in what ways the skills can be used;

3. One should understand how to apply the knowledge in new, previously not existent situations;
4. One should be able to analyse the results (usage of knowledge in new situations), and should know what has to be changed in order to improve the results next time (Hunter, 2004).

The diversity of used learning methods and forms allows to implement that: mutual learning in pairs and groups, presentation and defence of one's own statements, cooperative learning, work of guest lecturers (both attraction of academic personnel from other higher education establishments and involvement of professionals-practitioners in the learning process), consulting lectures, seminars, independent work, presentations, discussions, argumentations, analysis of scientific articles from data bases, reflection, analysis of videos, exhibitions, demonstrations, modelling, interviews, role plays, cooperation in learning, etc. It is completely understandable that cooperation is recognised as natural law for realisation in any sphere of life: in business, entrepreneurship, management, family, religion, and in society in general. Only in learning process cooperation between all involved participants not always justifies itself. As shown by the researches of Goodlad (1983) and Brophy & Good (1986), still 70 – 80 % of all what happens in lecture-room lies with the teacher, lecturer. These facts are convincing for a serious focus on elaboration and usage of new learning materials.

An important issue in elaboration of new learning materials is related to orientation towards the different learning styles of students. Dunn & Dunn (1992) note that when students are taught using their preferred learning styles, they show increased academic achievement, improved attitudes toward instruction, and better discipline than when they are taught using their non-preferred styles. As the learning style is determined biologically and is relatively fixed, adjustment to these different learning styles in accordance to the variable teaching methods and techniques is real (Dunn, 2003; Kolb, 2000; Honey & Mamford, 2000). Whereas in the established 4MAT system of McCarthy (1990, 1996, 2000) as addition to Kolb's cognitions, the most recent researches on peculiarities of the hemispheres of the brain and their influence on student's individual peculiarities during the learning process are included. All four learning styles in this approach are regarded as equally valuable, and they characterise completely different approaches to the learning process (Coffield et al., 2004):

1. Figurative learning – oriented towards search for answers to the question “why?”. These students like to listen, speak, cooperate, and use such learning methods as brainstorming, discussions. Thus the learning materials should be oriented towards trying to implement these possibilities.
2. Analytical learning – with orientation towards search for answers to the question “who?”. That is why these students will feel good if they are offered learning materials which make them analyse, classify, generalise, theorize, evaluate.
3. Learning through practical activities – by the desire to find answers to the question “how does it work?” in order to use what has been learned. In these learning materials the preference should be on possibilities to experiment, search for possibilities to develop, seeing tendencies, and implementing a particular offer.
4. Dynamic learning – with the desire to find answers to the question “What if?” In this case the range of learning materials should subordinate to the possibilities for students to modify, adapt, take risk, by offering alternative solutions, acting in a creative way.

By summarising all the above said, we can conclude that organisation of such study process, which is based on the individual needs of students and is in its essence people-oriented, is completely based on the faith in students and their abilities. The teacher-facilitator is focused on a favourable influence upon continuous learning process. In such a way, a study course is considered as successfully acquired not when the student has acquired everything foreseen in the programme, but when he/she has relevantly moved in the direction when he/she knows *how to learn* what is necessary for him/her and what he/she desires to find out. In such atmosphere of mutual responsibility and interest studies become even deeper, they leave even greater influence upon development of student's individual position.

In this context the transdisciplinary approach can be invaluable for creating the conditions for the maximal realization of manager's creative potentialities. Engaging with the spheres of practice and experience, as well as associated informal knowledge provides access to both the real-world character of human reasoning and interaction. The concept of border-work offers a conceptually coherent means of operationalising transdisciplinarity.

Conclusions

The conclusions are summarised as follow:

1. As it is necessary in the sphere of management to develop students' diverse competencies, it is more useful to base the study process on the transdisciplinary approach, which allows to study the flow of the innovation process and make conclusions which could be used in the practice planning of innovation activities. For study the management phenomenon, it is necessary to represent a combination of certain approaches and methods of dealing with complex, multifactorial problems. Thus in the context of transdisciplinary approach elaboration of learning materials should be based on four dimensions: systemic, cultural, creative, and interpretive.
2. A successfully elaborated teaching material facilitates study process at a higher education institution: it improves study quality, promotes formation of student's knowledge, skills and attitudes, as well as their development in a creative environment. As the educational paradigm orients to sustainability, emphasising transdisciplinarity and development of student's personality, the principles of elaborating teaching materials in management sphere are as follow: perception of human and society in its united wholeness, promotion of reflection and activity, development of a creative personality, transforming teaching materials according to student's individual peculiarities (learning style, functioning of the hemispheres of the brain, etc.), knowledge and experience as personal construct.

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