HOW TO TRAIN STUDENTS FOR TRANSFER OF KNOWLEDGE: THE ANALYSES OF TEXTBOOKS AND INSTRUCTIONAL MATERIALS FOR STUDENTS OF AGRICULTURE

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Abstract

Transfer of learned knowledge and skills is considered as a fundamental goal of education; without transfer, education would be meaningless. Subject of the study is the analysis of the 16 textbooks and instructional materials intended for students of Master studies "Environmental protection in Agriculture" at the Faculty of Agriculture University of Belgrade. In the study, the following analyses have been made: (1) the analysis of the type and number of *the structural components* of the textbooks; (2) the analyses of the questions, tasks and orders (QTO) in the textbooks, which comprises following analyses: (2.1) *the meaningfulness* of the QTO; (2.2) *the form* of the QTO; (2.3) *the function* of the QTO; and (2.4) *the cognitive processes* that is required by the QTO according to Revised Bloom's taxonomy of educational objectives. Generally speaking, the mechanisms for fostering and facilitating transfer of knowledge and skills in the most of analyzed textbooks are neglected or developed in a small degree, and unevenly distributed among the analyzed textbooks. The most of the materials enable development of just "very near", specific transfer to the situation of the exam in which the students will be exposed to the same type of the QTO like in the initial materials for learning. Except in few of the analyzed materials (three of 16), there is no solid ground for the promotion of transfer.

Key words: *animal sciences, questions, tasks and orders, textbooks, transfer of knowledge*

Introduction

Education system is based on the idea of transfer of knowledge and skills: once developed knowledge or skill can be used in other similar or dissimilar new situations. Without transfer, education would be meaningless. Therefore, through schooling students will learn the selection of important knowledge, skills and abilities by which they would be prepared for their private and professional lives in the future. Hence, educational aims and outcomes of learning/teaching process are based on transfer and they try to make it clear what is purpose of specific type and level of schooling.

For more than a century the problem of transfer of knowledge has been an important topic of research in educational psychology (for review of researches see: Cox, 1997; Singley and

Anderson, 1989; Mayer and Wittrock, 1996; Billing, 2007). Throughout its long research history transfer has been, and still is, a very controversial issue. There is no definition of transfer that all researchers would agree upon. There is a long lasting huge debate on nature of transfer and depending on theoretical lens the same set of empirical data is differently interpreted. One theoretical viewpoint is that transfer can be explained by similarity of two situations, i.e. existing of identical elements in both of them - one situation in which knowledge and skills are acquired and new one in which knowledge and skills have to be applied (Thorndike & Woodworth, 1901; Singley and Anderson, 1989). Other theoretical viewpoint supports the transfer of general skills, that under appropriate conditions students can learn to improve their problem-solving transfer (Salomon & Perkins, 1989; Mayer and Wittrock, 1996), or that "there are multiple manifestations of transfer, ranging from the understanding of domain-specific concepts through the deployment of relatively domain-general reading and argumentation strategies' (Campione, Shapiro and Brown, 1995, p.66). In spite of the conclusion that there is "an obvious need for further inquiry aimed at a better and deeper understanding of the processes underlying transfer and at finding effective research-based and practically applicable ways to facilitate transfer in learners in different educational and training settings" (De Corte, 1999, p.557), the numerous research findings support the idea of transferability of learned knowledge and usefulness of teaching for transfer.

Transfer may be *specific* or 'near' transfer of similar elements in the initial and target task (e.g. within the same type of problem in the same subject domain); and *general* or 'far' transfer of methods, general principles, techniques and attitudes (e.g. between domains). 'Near' or specific transfer implies that the initial and target tasks are closely related, having some similar elements, and 'far' transfer, i.e. general transfer implies transfer of knowledge, skills and attitudes to quite different problem context or content depends on more general, structural similarities (Billing, 2007). These types of transfer are not mutually exclusive, general skills and specific knowledge is complementary in transfer.

The practical significance of transfer of learning is quite obvious in both the cases of formal schooling and of 'knowledge-based economy'. Transfer of learned knowledge and skills is considered as a fundamental goal of education (Marini and Genereux, 1995), what is reflected in Seneca, Ancient Greek author's sentence: `Non scholae, sed vitae discimus" (we do not learn for school but for life). Also, importance of transfer of knowledge between education and workplace settings is clear. Today's business and industry invest enormous amounts of money in in-service training and retraining of personnel and they are strongly interested in acquiring transferable knowledge and skills by their employees to increase rate of return of investment, as well as reduction in spending. Bulk of the literature has been written on training transfer. Training transfer refers to the application, generalization and maintenance of trained skills on the job (Ford & Weissbein, 1997; Volet, 1999; Eraut, 2009; Grossman & Salas, 2011; Volet, 2013). The request of 'employability' has influenced on higher education programs significantly to take into account the competencies, which employers are said to prize most, so-called transferable or generic skills such as higher order thinking processes (problem-solving, critical and creative thinking), communication and team work. Perhaps the other reason is related to students paying fee for studying and "seeking 'value for money' "(Billing, 2007, p. 501).

The review of the literature on transfer shows that transfer of knowledge and procedures learned through instruction unfortunately occur far less often than academics believe (Alexander and Murphy, 1999). There are many research findings on transfer, which implications are important

for the teaching for transfer (or teaching of key skills) in higher education. The main conclusion from the research evidence is that whether transfer occurs is dependent on the conditions. The main conditions that can support or hinder the transfer are as follows (Perkins and Salamon, 1992a,b; Singley and Anderson, 1989; Alexander and Murphy, 1999; Bransford et al., 1999; Bransford & Schwartz,1999; Billing, 2007):

- Transfer is more likely *when the learning environment is designed to encourage cross-situation and cross-domain transfer*. Showing students how knowledge from different subjects or different contents of same subject are mutually connected, or how problems resemble each other is very useful;
- Skills and knowledge must be extended beyond the narrow context. To be widely applicable learning must be guided by generalized principles. *Learning of general principles of reasoning together with self-monitoring practices and potential applications in varied context* supports transfer. Procedures of generalization of higher mental abilities should be in-built in teaching/learning process. The specificity of the context in which principles are learned reduces their transfer;
- *Rote learning of facts discourages transfer of knowledge.* Learning of principles and concepts facilitates transfer to new situations and dissimilar problems because it creates more flexible mental representations;
- Transfer is supported *if students have conceptual knowledge, mental representation of problems* (including how one problem is similar and different from others), and *understanding of the relationships of the components in the overall structure of the problem*;
- Teaching in reasoning and critical thinking is only effective for transfer *when abstract principles and rules are accompanied by examples,* that have to be varied;
- Transfer is fostered *when learning takes place in social context* in which generation of principles and explanations are developed through interaction and so called 'negotiation of meanings';
- *Cooperative methods of learning* improve transfer;
- Transfer is promoted when *the feedback on performance* is given to students;
- Transfer and analogical reasoning are related processes and *transfer is promoted by teaching by analogy* and emphasizing structural similarities between analogues and the underlying goal structure of comparable problems;
- Transfer is fostered if *students are expected to learn to do some performance by themselves* and if they are *aware how to apply skills in different context*. The learner must understand the conditions of application – *when* what has been learned can be used;
- *Learning to use meta-cognitive strategies* is especially important for transfer. Learners are most successful if they are self-aware as learners and are able to monitor and evaluate their learning and develop strategies which keep learning on target. Meta-cognitive skills (e.g. self-monitoring, reflection, self-regulation, executive control strategies, learning-to-learn) are vital particularly in solving complex problems. Meta-cognitive strategies result in more sophisticated conceptions of learning, greater awareness of cognitive strategies, more complex and integrated knowledge structures, and more accessible and usable knowledge.

As we have mentioned previously, transfer of knowledge is encompassed by aims and outcomes of learning, and it has to be promoted by teaching/learning methods and instruction strategies. In

the light of the research evidences on transfer, the effectiveness of instruction and learning resources to foster transfer can be analyzed.

Purpose of this study

In spite of the new technological or 'ICT era' many researches clearly show persistent importance of the textbook in education (see: Johnsen, 1993; Mikk, 2000; Selander, Tholey & Lorentzen, 2002; Pingel, 2010; Ivic, Pesikan, Antic, 2013). Besides the teacher, textbook is the key 'instrument' in teaching/learning process. Textbook is not the exposition of information; its role is to support independent construction of knowledge. The textbook has to create situations for learning and all of its structural components (e.g. core text, illustrations, tasks, questions, summaries, additional resources, critical thinking units, etc) have to be aligned in a harmonious and coherent manner in order to achieve the learning objectives (Ivic, Pesikan and Antic, 2013).

The purpose of this study is to see how the teaching of transfer is supported through the instructional materials for students of animal sciences. To encourage and facilitate transfer of knowledge and skills, the specific measures have to be built-in the textbook. We will take into the account the structural components of textbook (which are intended to empower understanding and acquiring lasting and applicable knowledge) and particularly questions, tasks and orders, which should provoke different mental processes and learning styles, enabling students to practice important knowledge and skills and accomplish desirable outcomes of the course. (Ivić, Pešikan, Antić, 2013).

Subject of study

Subject of the study is the analysis of the 16 textbooks and instructional materials intended for students of Master studies "Environmental protection in Agriculture" at the Faculty of Agriculture University of Belgrade. All textbooks have been written within the frame of the WUS Austria MSDP 004/2009 project, with the aim to help learning process of students. In the study, the following analyses have been made: (1) the analysis of the type and number of *the structural components* of the textbooks; (2) the analyses of the questions, tasks and orders (QTO) in the textbooks, which comprises following analyses: (2.1) *the meaningfulness* of the QTO; (2.2) *the form* of the QTO (e.g. open-ended questions with short answer, essay, multiple choice, matching, etc); (2.3) *the function* of the QTO: supporting the construction of knowledge or evaluation of what has been learnt; and (2.4) *the cognitive processes* that is required by the QTO according to Revised Bloom's taxonomy of educational objectives (RBT - Anderson and Krathwohl, 2001).

The structural components (SKs) of textbook contribute to better understanding of the content; linking content with previous knowledge and students' experience; improving the assimilation of presented material; and improving learning efficiency of students (Ivić, Pešikan and Antić, 2013). Within the textbook there can be different SKs: thematic units or chapters; lessons; questions, tasks and problems (at the end of the lesson or thematic unit); boxes with additional information; boxes with definitions of less known words; illustrations accompanied the text (e.g. drawings, pictures, graphs, schemes, maps, tables, etc); summaries of the lesson or thematic unit; table of content; etc.

QTO are the most important structural component of textbook for activating students in the process of learning. Consideration *of the meaningfulness of QTO* is the first step in the evaluation of the quality of QTO in the textbook. QTO can be meaningless according to several criteria: linguistically incorrect task, unrealistic task (e.g. too difficult or too easy for the student, or there is no prerequisite to enable fulfilling the tasks - no time, no experience, no conditions, etc), intellectually imprecise task (e.g. when student is confused and not know what is required to do in the task), quasi-activating task (e.g. an activity with no purpose or effects for learning is required), and task which suggests the answer (e.g. Is it nice hurting others?) (Ivić, Pešikan and Antić, 2013).

There are *two distinct functions of the QTO*: (a) assessment for learning and assessment as learning, where the role of the QTO is to support the construction of knowledge by creating the situations for learning for students. What the students are doing, they will learn it. Second function of QTO (b) is well-known assessment of learning, i.e. evaluation of what was learnt by students.

Methodology

The method of content analysis has been used in the study. The sample was the convenience sample (Marshall, 1996) involving the 16 textbooks and instructional materials for students of Animal Sciences at the Agriculture Faculty in Belgrade that have been developed and published in the frame of the WUS Austria project and were available for the analyses. In the (1) analysis the unit of analysis was the textbook and in the (2) analyses the unit was individual question, task, or order in the textbook.

The full titles of the analyzed textbooks are not given, just abbreviations, because of discretion. In this study we are not interested in the analysis of the quality of individual textbook than looking for the possibilities for transfer promotion at the wider setting in higher education in Serbia.

Results and discussion

  (1) The analysis of the type and number of the structural components of the textbooks

The Table 1 shows that there are 18 different structural components in the analyzed textbooks: Table of contents, Introduction/Foreword, Core text, Important to know, Summary, Illustrations, Questions, tasks and orders, Advanced organizer of thematic unit, Advanced organizer of lesson, Interesting facts, How to learn, Key words, Additional information: website addresses and journals, Goals and outcomes, Dictionary of unknown words and phrases, and Case studies. The range of SKs varied from 5 to 11 per textbook and about 70% of the textbooks have just one third of them (5-7). The number of SKs is an indicator of learner-centered orientation of textbook because the function of the SKs is improving of learning efficacy and fostering transfer.

What types of the SKs are presented in the textbooks? Only three of them (Introduction and/or Foreword, Core text, and Illustrations) are presented in all analyzed materials. But, these components are characteristic for any kind of book. The problem is the absence of the SKs that are specific for the textbook as a special genre of book which have formative-developmental role (Ivić, Pešikan and Antić, 2013). If the textbook does not contain QTO, then it is not a textbook,

and half of the analyzed materials have no QTO at all. The absence of some of the most important textbook's components, and rare appearance of other SKs that are supports to understanding and knowledge construction (such as summary of lesson or thematic unit, dictionary, index of concepts, how to learn unit, case studies, etc.) is significant (but bad) sign in regard of transfer of knowledge.

Table 1. *Structural components of the analyzed textbooks*

Textbooks	Table of contents	Introduction/Foreword	Core text	Important to know	Summary	Illustrations		Questions, tasks and orders (QTA)	Advanced organizer		Interesting facts	How to learn	Key words	Additional information (websites, journals)	Sequence of integration	Goals and outcomes	Dictionary	Case studies	Σ
						Representational (e.g. drawings, photos)	Non-representational (map, diagrams, scheme, table)		of thematic unit	of lesson									
1.ZZ	+	+	+			+	+												6
2. EA	+	+	+			+	+	+											6
3. EZ	+	+	+					+					+	+					6
4. PE	+	+	+			+	+	+											6
5.ZR	+	+	+	+		+	+												6
6. ZV	+	+	+			+	+												5
7. ZS	+	+	+	+	+	+	+												6
8. EP	+	+	+			+	+		+		+								7
9. ET	+	+	+			+	+												5
10. GS	+	+	+		+	+	+	+	+						+				9
11. Em	+	+	+										+				+	+	+	7
12.BD	+	+	+			+	+	+	+										7
13. Zz	+	+	+	+		+	+	+											7
14. ZP	+	+	+			+	+	+					+	+					8
15. EG	+	+	+			+	+	+			+								7
16. EM	+	+	+		+	+	+	+	+	+		+		+					11
Σ	16	16	16	3	3	14	14	9	4	1	2	2	2	3	1	1	1	1	

Hence, the results of first analysis show that there is very few of the structural components, and some of crucial the textbook's components are absent or appear rare and unsystematically,

haphazardly in the analyzed textbooks. That means that they are not designed purposefully with the clear idea to enable and empower students' learning. Generally speaking, the analyzed materials mainly expose the content of the subjects and missed the opportunities to involve students in learning process and support their transfer of knowledge.

(2) The analyses of the questions, tasks and orders (QTO) in the textbooks

(2.1) Analyses of the meaningfulness of QTO

The QTO appears in 9 of 16 textbooks and total number of the QTO is 967 (Table 2). The QTO are not evenly distributed among the textbooks. Almost two-thirds of all QTO (653 or 67.5%) are found in three textbooks. In 4 of 9 textbooks with the QTO, meaningless QTOs exist (unrealistic tasks, quasi-activating, linguistically incorrect and intellectually imprecise tasks). There are not many of them (4.5%), but they shouldn't exist at all in textbooks. The meaningless questions are not only unusable but harmful: consume space in textbooks, de-motivate students for work and hinder transfer.

Table 2. *Number of the meaningful and the meaningless QTO in the textbooks*

Textbooks	Meaningful QTO	Meaningless QTO	Σ
1.ZZ	0	0	0
2. EA	48	3	51
3. EZ	103	0	103
4. PE	47	0	47
5.ZR	0	0	0
6. ZV	0	0	0
7. ZS	0	0	0
8. EP	0	0	0
9. ET	0	0	0
10. GS	30	5	35
11. EM	0	0	0
12.BD	33	29	62
13. Zz	170	3	173
14. ZP	85	0	85
15. EG	374	3	377
16. EM	34	0	34
Σ	**924** **95.5%**	**43** **4.5%**	**967** **100%**

(2.2) Form of QTO

One type of the task form dominates in the textbooks: open-ended question with short answer. Almost all tasks are of this type - 99.6% (see Table 3). Uniformity of the type of tasks is boring for students, is not suitable for different learning styles and cannot stimulate variety of cognitive processes. All these cannot support the transfer of knowledge.

Table 3. *Number of the QTO according to their form*

Total number of the QTO in the textbooks*	Open-ended tasks		Closed type of tasks		
	Essay	*Short answer*	*Multiple choice*	*Two-choice answers (yes-no, true-false)*	*Matching*
924 (100%)	-	**920 (99.6%)**	**4 (0.4%)**	-	-

* Note: Only meaningful tasks entered into the analysis

(2.3) Functions of QTO

Table 4. *Number of the QTO according to their function*

Total number of the QTO in the textbooks*	Supporting construction of knowledge	Evaluation
924 (100%)	**85 (9.2%)**	**839 (90.8%)**

* Note: Only meaningful tasks entered into the analysis

Assessment for learning and assessment as learning are not recognized functions of the QTO in the analyzed textbook, 90% of the tasks checks how much students have learned from the lessons (see Table 4). It indicates that the textbooks are not learner-centered but content-centered what cannot support the transfer of knowledge and skills.

(2.4) Cognitive processes that QTO activate, according to RBT

Textbook must have tasks that involve students in the relevant activities with the content, but number of QTO by itself is not the guarantee of the textbook quality. Mental activities, types of cognitive processes that are initiated by tasks are of crucial importance. Quality of knowledge depends on the quality of cognitive processes that are activated in the process of learning from textbook. In this study, the Revision of Bloom's Taxonomy – RBT (Anderson & Krathwol, 2001) has been used for the analysis of the cognitive processes initiated by the QTO in the textbooks (see Table 5).

According to the findings, the focus of the textbooks is on factual knowledge (essential facts, terminology, details or elements of specific disciplines). The main cognitive processes lying behind the factual knowledge in the textbooks are remembering (46% of all the QTO) and understanding (25.4% of all the QTO). Applying of procedural knowledge (10% of all the QTO), that helps students to do something specific to a discipline or subject of study, is very important particularly in applied sciences like agriculture. However, all the tasks of this type are in one textbook (practicum) intended for training of students in implementation of experimental procedures. In the textbooks is negligibly small percentage of conceptual knowledge, knowledge of classifications, principles, generalizations, theories, models, or structures important for a particular discipline. In the QTO the content of the disciplines is given in the narrow context without learning of general principles, varying the context and using analogical reasoning.

Table 5. *Knowledge dimensions and cognitive processes that the QTO activate in the textbooks, according to RBT*

Knowledge dimensions**	Cognitive processes*					
	Remembering	*Understanding*	*Applying*	*Analyzing*	*Evaluating*	*Creating*
Factual Knowledge	**425 (46%)**	**235 (25.4%)**	3 (0.3%)		1 (0.1%)	
Conceptual knowledge	40 (4.3%)	63 (6.8%)	3 (0.3%)	1 (0.1%)	4 (0.4%)	
Procedural knowledge	33 (3.6%)	17 (1.8%)	93 (10.1%)	2 (0.2%)	2 (0.2%)	
Meta-cognitive knowledge						

Note:

*The cognitive processes are defined as:

• **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
• **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
• **Applying**: Carrying out or using a procedure through executing, or implementing.
• **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
• **Evaluating**: Making judgments based on criteria and standards through checking and critiquing.
• **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing (Anderson and Krathwohl, 2001, pp. 67-68)
** The knowledge dimensions are defined as:
Factual knowledge is knowledge that is basic to specific disciplines. This dimension refers to essential facts, terminology, details or elements students must know or be familiar with in order to understand a discipline or solve a problem in it.
Conceptual knowledge is knowledge of classifications, principles, generalizations, theories, models, or structures pertinent to a particular disciplinary area.
Procedural knowledge refers to information or knowledge that helps students to do something specific to a discipline, subject, or area of study. It also refers to methods of inquiry, very specific or finite skills, algorithms, techniques, and particular methodologies.
Meta-cognitive knowledge is the awareness of one's own cognition and particular cognitive processes. It is strategic or reflective knowledge about how to go about solving problems, cognitive tasks, to include contextual and conditional knowledge and knowledge of self.

Besides the practicum, there is in fact no applying of knowledge in the textbooks, and no processes of analyzing, evaluating and creating of knowledge. Critical thinking consists of the processes of analysis, evaluation and creation; it is contextual, evaluative and meta-cognitive thinking by its nature. In the textbooks there is no meta-cognitive knowledge in the QTO at all, not even at the level how to learn certain subject. In many European education documents learning to learn is emphasized as one of the key competencies in 21st century (European Communities, 2007; Gordon et al., 2009). 'Learning to learn' is the ability to pursue and persist in learning, to organise one's own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome

obstacles in order to learn successfully. This competence means gaining, processing and assimilating new knowledge and skills as well as seeking and making use of guidance. Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training' (Gordon et al., 2009, p.45). Development of meta-cognitive knowledge, critical thinking and 'learning to learn' is the task for all disciplines and all subjects at all education levels.

The evidences on transfer emphasize that: learning of principles and concepts facilitates transfer to new situations and dissimilar problems; skills and knowledge must be extended beyond the narrow context; the specificity of the context in which principles are learned reduces their transfer; transfer is supported if students have conceptual knowledge; and learning to use meta-cognitive strategies is especially important for transfer. Bearing in mind this evidences, the results of the analysis of the cognitive processes that is required by the QTO in the analyzed textbooks are discouraging in regard to the transfer.

In spite of such general results of the analysis, it has to be noted that there are three textbooks that are different in comparison with others. They did not fully succeed to make good learning-centered materials, but they have made steps forward to improvement of students' learning. The authors of these textbooks had started to implement some of the active learning ideas and were starting to improve their teaching methods (Pešikan and Antić, 2009), and then first results have appeared. So we come to the issue of the education policy and the system's care for the quality of teaching/learning in higher education and necessity for systematic training of academics about modern conception of teaching/learning and their practical implementation.

Conclusion

Generally speaking, the mechanisms for fostering and facilitating transfer of knowledge and skills in the most of analyzed textbooks and instructive materials intended for the students of Master studies "Environmental protection in Agriculture" at the Faculty of Agriculture in Belgrade are neglected or developed in a small degree, and unevenly distributed among the analyzed textbooks. The most of the materials enable development of just "very near", specific transfer to the situation of the exam in which the students will be exposed to the same type of the QTO like in the initial materials for learning. Except in few of the analyzed materials (three of 16), there is no solid ground for: the development and promotion of transferable, generic skills (higher cognitive processes: problem-solving, critical thinking, communication and team-work); cross-situation and cross-domain transfer; practicing and applying skills and knowledge in wider and different contexts; the development of the conceptual knowledge and the understanding of the overall structure of the phenomenon; the development of meta-cognitive strategies; and for the cooperation with others on the work on the QTO. Staying predominantly at the level of reproducing of the subject's information with understanding is not the good base for the promotion of transfer.

However, two things should be noted. First, the obtained results are in accordance with the results that we have got in the analyses of the textbooks for pre-university education. The main problem of the education system in Serbia is the quality of education (see: Strategy for development of education in Serbia to 2020+, 2012; Ivić and Pešikan, 2012) and higher education has double task, to cope both with the quality of its teaching/learning and the quality of teacher preparation for all education levels. Second, academics in Serbia have no preparation

for their teaching role. They see themselves predominantly as scientists and not as teache
promotion is based on their scientific output, and quality of their pedagogical work is ve
taken into account. The exception to the rule is the development of Active Learning Pro
the Faculty of Agriculture in Belgrade (Pešikan, Poleksić, and Antić, 2005; Pešikan, 200;
et al., 2005; Poleksić et al., 2006; Pešikan et al., 2006; Pekić Quarrie, 2007a; Pekic
2007b; Antić, Ivić and Pešikan, 2008; Pešikan, Antić and Quarrie, 2009) and other agı
faculties in Serbia (CaSA Tempus Project, 2014). These universities are among the firs
recognized the need to improve the quality of teaching/learning. Of course, this requires
investment of time and effort and result would not be guaranteed if there is no suppor
system to make the changes become viable and compulsory for all higher education inst
in Serbia. The findings show that training of the academics in pedagogic skills and
learning/teaching methods gives visible effects on improving the quality of teaching/learr
transfer of acquired knowledge.

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