A SYSTEMIC APPROACH TO IMPROVING INNOVATIVENESS IN HIGHER EDUCATION

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Abstract
Innovativeness can be seen as a major competitive advantage in organizations enhancing their effectiveness and enabling the basis for sustainable development. Innovations in higher education systems have an impact on all the systems elements, relationships as well as on the higher order system in which higher education institutions (HEIs) are embedded, ranging from individuals to organizations. A holistic approach to innovativeness in higher education is required in order to improve innovativeness. The paper deals with the issues of improving innovativeness in higher education from the viewpoint of Soft Systems Methodology (SSM), as a relevant interpretive systems approach. The main purpose of this paper is to demonstrate how this systemic approach can help to explore the complex and pluralist nature of management innovativeness in higher education and provide a foundation for improving innovativeness of HEIs. Accordingly, the paper contributes to reveal different perceptions and interpretations of HEIs’ relevant stakeholders on innovativeness, as well as to identify systemically desirable and culturally feasible changes which can improve innovativeness of HEIs. Findings will be useful for HEIs to improve their innovativeness.

Keywords: innovation, improving innovativeness, higher education, Soft Systems Methodology

SISTEMSKI PRLAZ UNAPREĐENJU INOVATIVNOSTI U VISOKOM OBRAZOVANJU

Apstrakt
Inovativnost se može posmatrati kao ključnokonkurentska prednost u organizacijama koje nastoje da unapreduju svoju efikasnost i stvore osnovu za održivi razvoj. Inovacije u sistemu visokog obrazovanja utiču na sve elemente sistema, odnose između njih, kao i na sistem višeg reda u kome visokoobrazovne institucije funkcionišu. Navedeno implicira holistički prilaz upravljanju inovativnošću u visokom obrazovanju. Shodno tome, rad se bavi relevantim pitanjima i problemima upravljanja inovativnošću u visokom obrazovanju iz perspektive Metodologije soft sistema (MSS), kao relevantnog interpretativnog sistemskog prilaza. Ključna svrha rada je da se pokaže kako ovaj sistemski prilaz može da pomogne u istraživanju kompleksne i pluralističke prirode upravljanja inovativnošću u visokom obrazovanju, kao i stvaranju osnove za unapređenje inovativnosti u visokom obrazovanju. Doprinos rada se ogleda u otkrivanju različitih percepcija i interpretacije koje relevantni stakeholderi imaju o upravljanju inovativnošću u visokom obrazovanju, kao i identifikovanju sistemske pozeljnej i kulturno izvodivih promena kojima se može unaprediti inovativnost u visokom obrazovanju. Sažetka u radu će biti korisna za visokoobrazovne institucije kako bi poboljšale svoju inovativnost.

Ključne reči: Inovacije, unapređenje inovativnosti, visoko obrazovanje, Metodologija soft sistema

INTRODUCTION

Innovation and creativity are widely accepted as the dominant factors of sustainable economic and social development. Many researchers (e.g., Klomp and Van Leeuwen, 1999; Bouchikhi and Kimberly, 2001) consider innovation as the long term key for improving domestic economies, through the resolving of socio-economic problems, such as unemployment and productivity growth. As all sectors, higher education is not immune to this escalating global interest in innovation. Innovation will be essential to bring about qualitative changes in education in order to increase efficiency and improve the quality of learning opportunities (Tierney and Lanford, 2016). At the same time, higher education institutions (HEIs) play crucial role in fostering creativity and innovation, by enabling the development of specific knowledge and skills with generic capacities linked to creativity, such as curiosity, intuition, critical and lateral thinking, problem solving, risk taking and the ability to learn from failure (Valenčić-Zuljan and Vogrinc, 2010).

In line with the Europe 2020 Strategy (European Commission, 2010) and the efforts of the European Union (EU) to become an innovation union, there is a need to improve the distribution of knowledge, innovativeness and cooperation between academia and industry. As a relevant and contemporary research area, innovativeness in higher education is the subject of research in numerous studies (e.g. Carayannis and Rakhatmullin, 2014; Potocan, Nedelko, Mulej and Dabic, 2016), while decades ago innovation was primarily in the domain of business organization and has been recognized as an important factor of organizational success (e.g. Rogers, 2003; Skarzynski and Gibson, 2008; Foss and Saebi, 2017).

Innovation in higher education can be seen as a process of institutional adaptation to changes in the environment, which foster HEIs to improve their existing practice, as well as to be innovative at different levels and in different forms. Moreover, innovativeness is also related to internal characteristics of HEIs, i.e. to organizational culture, strategies and structure (Hasanefendic, Birkholz, Horta, and van der Sijde, 2017). We can also observe Innovation in higher education as a result of changing contexts in which HEIs function. In this regard, the research of institutional factors that influence innovation, as well as the analysis of key stakeholders and their role in improving innovation in higher education is an important research area.

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Overview of current literature about innovativeness in HEI, reveals that it does not provide a deep insight into the core idea of innovativeness of HEI, which is reflected in lack of commonly accepted definitions of innovativeness, which will reveal various facets of innovativeness in HEI, what is the current state of HEI innovativeness, etc. Focusing on another under-represented field – drivers and barriers of innovativeness in HEI, it is evident that literature offers several studies, dealing with single or few factors of innovativeness in HEIs, such as rapid development of technology, for instance (e.g. Garrison & Kanuka, 2004). Although some studies consider simultaneously several drivers of innovativeness and admit the importance of using holistic approach to study key drivers of innovation in HEIs (e.g. Serdyukov, 2017) they do not apply the tools of interpretive systems approaches to deal with these issues. To sum up, the current literature does not offer an overview of key drivers of HEI innovativeness, which is important to design research approach for examining what drives innovativeness of HEI. Actually, there are no identified SSM applications in improving innovativeness in higher education (to the best of the authors’ knowledge) and shortage about definition of drivers of innovativeness in HEIs which is an important research gap. Thus, the subject of research in this paper is improving innovativeness of HEIs from the perspective of the (SSM), as an interpretive systems methodology. Based on outlined research gap, the main goal of the paper is to show how this systems approach can help to explore the complex and pluralistic nature of improving innovativeness in higher education. On that note, rich pictures, root definitions and conceptual models will be used as relevant SSM tools. In this context, the paper addressed above outlined shortage in the literature and provide a holistic approach to key drivers of innovativeness in HEIs utilizing Soft Systems Methodology (SSM).

The main contribution of the paper is systemic approach to improving innovativeness in HEI by utilizing Soft Systems Methodology, which has not been yet done in the literature. In that context the aim of this paper is to outline possible improvement of innovativeness of HEIs from the perspective of the (SSM), as an interpretive systems methodology. The contribution of the paper is seen also in discovering the perceptions of different stakeholders on improving innovativeness in higher education, but also in identifying systemically desirable and culturally feasible changes that could enhance innovativeness in higher education. Findings would be beneficial for HEIs to improve their innovativeness, using proposed approach in the paper, which has not been previously consider nor used in HEIs. Next, another contribution is related to the identification of key drivers of innovativeness in HEI, which will represent an important starting point for future consideration of innovativeness in HEI from various viewpoints. Cognitions in this paper are also useful for further consideration of innovativeness in HEI – through focusing on different possible facets of innovativeness, proposal of basic components of the instrument for surveying innovativeness in HEI, etc.

The paper consists of three logically connected entities. The first part refers to the key features and factors of improving innovativeness in higher education. The second part deals with key theoretical-methodological and applicable features of Soft Systems Methodology. With the aim of identifying the possible ways of improving innovativeness in higher education, final part of the paper will use certain SSM tools that point to the significance of different aspects of improving innovativeness and enable identifying of areas for its improvement.

**INNOVATIVENESS IN HIGHER EDUCATION**

Innovation can represent any kind of novelty considered to be useful in practice. In other words, innovations always include certain inventions and their commercialization, where invention involves all new ideas that could become innovations. In fact, innovation is the result of a complex process that depends on different, interactive preconditions, which can be labeled as a dialectical system (Zlatanović and Mulej, 2015). In accordance with the above, the European Commission defines innovation as the "result of complex interactions between individuals, organizations and factors from the environment, and not as a linear trajectory from new knowledge to a new product" (European Union, 2006).

Innovativeness can also be seen as a multiphase process in which organizations transform ideas into new/advanced products, services or processes with the aim of enhancing competitiveness and successful differentiation on the market (Baregheh, Rowley and Sambrook, 2009).

HEIs should re-examine the existing models of functioning in order to provide knowledge and skills that students will need in the labor market. One of the preconditions for improving innovativeness in higher education is also synergy which arises from the cooperation of different groups within the internal environment of HEIs (Lašáková, Bajžíková and Dedzé, 2017). Garcia and Roblin (2008) point out that it is important to facilitate internal cooperation and to stimulate team work, to encourage openness to new ideas and to distribute power. Nevertheless, despite efforts to support team work, organizational culture in HEIs often neglects it.

On that note, it can be pointed out that organizational culture at universities is often conservative and resistant to changes and that it has a tendency to maintain a status quo. Nedelko and Potočan (2013) particularly stress the importance of changing the organizational culture, i.e. changing the values and opinions, for improving innovativeness in modern organizations. Therefore, an innovative organizational culture is needed, characterized by resourcefulness, taking initiatives without prior instructions, morality in decision-making and taking
responsibility, an environment that fosters innovativeness, teamwork, tolerance for failure and mistakes etc. (Roffeef et al., 2016). In order to create an innovative organizational culture, consistent support of the appropriate power structures, both political structures that create regulatory framework and leadership of HEIs, is required. Moreover, there is a need for an institutional policy that supports innovation, the establishment of appropriate organizational structures in HEIs (for instance, a special organizational unit for improving innovativeness), as well as a strategic approach to selection and evaluation of innovation. Also, according to Kunnari and Ilomäki (2016), organizational structure and culture must be aligned with new, adaptive modes of learning, in order for integration and diffusion of innovation to be successful.

Despite the need for continuous institutional support, financial constraints and rigid regulation can be viewed as key barriers to improving innovativeness in higher education (Lašákova et al., 2017). In fact, in most European countries, restrictive national budgets intended for higher education can represent another important barrier to innovative learning. In contrast, rapid development of technology can be seen as a driver of innovation and university development – for example, through fostering distance learning. However, despite the development of information and communication technologies, their impact on higher education is still minimal (Lašákova et al., 2017).

In order to improve innovativeness in higher education, it is necessary to create the conditions for sharing knowledge and information with other participants, increasing the level of individual commitment and looking for answers, creativity and innovative solutions. Consequently, better understanding of the knowledge management process will stimulate innovative behavior (Zlatanović and Mulej, 2015).

Therefore, one can ask the question how innovations in higher education can be measured. Starting from Oslo Manual definition as widely accepted definition of innovation, innovation in higher education institutions refers to their ability to produce and implement a new or enhanced process, product, or organizational method which has a considerable effect on the activities of a higher education institution and or its stakeholders such as students, communities, and firms (Brennan et al., 2014). Actually, we can measure innovation in HEIs through 1) new products and services, such as a new syllabus, textbooks or educational resources; 2) new processes for delivering their services, such as the use of ICT in e-learning services; good financial management, continuous improvement of skills, and implementing incentive reward systems for members of staff so as to stimulate innovation; 3) new ways of organising their activities, such as ICT to communicate with students and parents; or 4) new marketing techniques, e.g. differential pricing of postgraduate courses (OECD, 2016, p.16). According to Al-Hussein and Elbeltagi (2016) product innovation within the HE environment can be defined as accepting, developing, and implementing new products such as courses, research projects, teaching materials, and curricula.

Considering the review of the relevant literature and especially relying on the results of the research conducted at ten different universities in the EU (Lašákova et al., 2017), it can be observed that the current state of innovativeness of higher education is characterized by the following features:

- disparity between the needs of HEIs and institutional, i.e. regulatory framework (e.g. insufficient funding for higher education, high level of bureaucracy, low level of information transparency, rigid accreditation rules, etc.);
- insufficient cooperation with the economy;
- inconsistency of technological development (e.g. inconsistency of information and technology methods by individual departments);
- internal processes at HEIs (e.g. slow decision-making process, poor communication between different organizational units, poor coordination of activities, conservative and bureaucratic organizational culture);
- rigid process of human resource management (e.g. rewarding that does not stimulate innovativeness, teachers’ workload, lack of material, technical and technological support);
- characteristics of teaching staff that discourage innovation (inadequate information and communication skills of teaching staff, negative attitude of teaching staff towards changes (expressed, for instance, through job security as a primary care, without taking any risk), application of conservative teaching methods);
- characteristics of students that discourage innovation, such as insufficient motivation of students, negative attitude towards innovation that can be seen in the following: preference of conventional teaching methods, unfamiliarity with innovative methods, lack of will, etc. (Ellis, 2015), inadequate information and communication skills of students, as well as low level of involvement of students in decision-making.

According to the above mentioned, we can emphasize that innovation can be related to one, several, or all aspects of the educational system: theory and practice, curriculum, teaching and learning, policy, technology, institutions and administration, institutional culture, and teacher education. It can be applied in any aspect of education that can make a positive impact on learning and learners. In a similar way, innovation in higher education concerns all stakeholders: the learner, parents, teacher, educational administrators, researchers, and policy makers and requires their active involvement and support (Serdykov, 2017).

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In general, innovation in higher education can be viewed as a system consisting of different elements and relations. At the same time, this system is part of a higher order system, i.e. it is connected with economy, governmental and non-governmental organizations and society as a whole. Thus, a holistic approach to improving innovativeness is needed in order to enable the examination of different elements of innovativeness in higher education, i.e. to identify the key factors which (de)stimulate innovations, their interactions, as well as interactions with other relevant stakeholders at national and supranational level.

Therefore, we can apply a systemic approach to innovation which implies that decision-making on innovation cannot be viewed only as an independent decision-making at the level of HEIs, since it includes more complex interactions between different organizations. In addition, it is important to consider the social and cultural context; institutional and organizational framework; infrastructure; processes for creating and transferring knowledge etc. One of the arguments in favor of the holistic approach to improving innovativeness in higher education is that the above factors have a decisive influence on the level at which innovative decisions are made, as well as on the forms of innovation being implemented (Smith, 2000).

When applying traditional management tools to complex problems, certain limitations appear since complex problems become simplified into their constituent parts and then managed through discrete interventions. This simplification consists in isolation of actors and interventions, which disables complex problems of improving innovativeness to be properly addressed. Applying a systemic approach to managing innovation in higher education is useful to map the dynamic of the system underpinning it, how the relationship between system components affect its functioning, and what interventions can lead to better results. Managing innovativeness in higher education can be studied as a complex-pluralist problem situation for which the appropriate holistic instrumentarium is suitable (Petrović, 2013). While conducting research on improving innovativeness in higher education as a complex-pluralistic problem situation, some of the interpretive, i.e. soft system methodologies can be applied.

Since improving innovativeness can be explored as complex-pluralist problem situation, some of the interpretive, i.e. soft systems methodologies can be applied. In the given context, the possible use of the interpretive Soft Systems Methodology will be presented. The main benefits of applying SSM consists in discovering the perceptions of different stakeholders on improving innovativeness in higher education, their interactions at national and supranational level, but also in identifying systemically desirable and culturally feasible changes that could enhance innovativeness in higher education. In fact, using SSM enables to challenge existing ways of seeing and doing things, and can lead to some shifts in worldviews, opening up new proposals for change. These changes can be observed from two different perspectives: as the result of changes in the environment (e.g. changes of regulatory framework) or as the result of changes in the internal characteristics of HEIs (e.g. organizational structure or culture).

**KEY FEATURES OF SOFT SYSTEMS METHODOLOGY**

SSM represents a relevant interpretive systemic approach that tends to encompass different perceptions of reality, facilitating in this way the learning process in which different understandings are examined and discussed in a way that leads to the deliberate action and improvement. Certain assumptions about society and social systems are also incorporated in SSM. The social system is viewed as a constantly changing conception of the roles, norms and values of the participants, used for defining a particular situation. In managing problem situation, SSM is applied through the following four key stages (Checkland, 2000):

1. Examination of a problem situation using rich pictures and root definitions;
2. Building conceptual models of the purposeful activity;
3. Discussing the problem situation using the models, i.e. comparing the models with real world situations and
4. Taking action, i.e. implementing changes that will lead to improving the problem situation.

Initial expression of the problem situation is achieved by the construction of the so-called rich picture of a given situation that allows one or more viewpoints based on which the problem situation will be further investigated. Given that pictures, in general, are better means of perceiving and expressing different relationships than words, rich pictures involve key participants of some situation and show their interests, perceptions and interactions (Zlatanović and Nikolić, 2017).

The defined rich pictures can serve for further development of the root definitions. The root definitions can be formulated as follows: a system that needs to do something that is marked with P by means of Q in order to achieve R. The term ‘to do P’ refers to a particular transformation to be carried out. The term ‘by means of Q’ denotes the activities necessary to do P, that is, the activities needed to transform some input into the corresponding output. The term ‘to achieve R’ refers to the understanding of the world that makes the transformation meaningful. As an extended statement of the defined PQR model for formulation of root definitions, CATWOE model was also developed (Checkland and Tsouvalis, 1997).

The appropriate conceptual models are developed from the root definitions. The conceptual models themselves are the result of the answer to the question of what the system needs to do to be a system that is
named in the root definition. While the root definition is an expression of what the system is, the conceptual model expresses the activities that must be undertaken by the system in order to be a system that is named in the definition (Checkland and Tsouvalis, 1997). Elements of the conceptual model are verbs, i.e., verbal phrases that denote activities defined in the root definition. Experience has shown that the best way for building a conceptual model is to start with verbs that reflect the key activities contained in the root definitions.

As the final stage in the application of SSM in the structuring of problem situations, the comparison stage is the point in which intuitive perceptions of the problem situation are brought into conjunction with systemic structures, which ensures a deeper epistemological and more general expression of reality (Checkland, 1996, 177). The result of the comparison phase is the appropriate assessment of the investigated problem situation from which the debate on possible changes arises. The debate on possible changes should lead to identifying the changes that must meet the two key criteria: The first criterion consists in the fact that the changes must be systemically desirable, such as the introduction of mechanisms of assessing effectiveness, ensuring that resources are adequate, etc. The second criterion relates to the cultural feasibility of changes ensuring that the elements of culture are not ignored, that is, providing respect for a certain world view, i.e., Weltanschauung, expressed in the root definition (Checkland, 1996, 181). Changes identified as systemically desirable and culturally feasible should be implemented, which represents the final stage of the SSM application.

The practical usefulness of the SSM application in different studies is given in the Table 1, identifying different areas of application of this methodology.

<table>
<thead>
<tr>
<th>FIELDS OF SSM APPLICATION</th>
<th>CASE STUDIES</th>
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</thead>
<tbody>
<tr>
<td>Project management</td>
<td>Lockett et al., 2006</td>
</tr>
<tr>
<td>Strategic management</td>
<td>Díaz-Parra et al., 2014</td>
</tr>
<tr>
<td>Risk management</td>
<td>Majeand Sunjka, 2014</td>
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<tr>
<td>Performance management</td>
<td>Jacobs, 2004</td>
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<tr>
<td>Organizational design</td>
<td>Presley et al., 1998</td>
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<tr>
<td>Quality management</td>
<td>Bennet and Kerr, 1996</td>
</tr>
<tr>
<td>Information systems</td>
<td>Taylor et al., 2007</td>
</tr>
<tr>
<td>Higher education</td>
<td>Yadin, 2013</td>
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<tr>
<td>Innovation management</td>
<td>Loffler et al., 2009</td>
</tr>
<tr>
<td>Efficient energy use</td>
<td>Neves et al., 2004</td>
</tr>
<tr>
<td>Managing natural disasters</td>
<td>Gregory and Midgley, 2000</td>
</tr>
<tr>
<td>Health protection</td>
<td>Fahey et al., 2004</td>
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Source: Authors

As the Table 1 shows, SSM can be applied in different areas, based on which we can consider it as a highly applicable methodology. Also, it can be seen from the table that SSM has already been applied in the field of higher education. Nevertheless, it is of relevance to point out that, when it comes to researching the problem area of improving innovativeness in higher education from the perspective of SSM, the appropriate application of this methodology in the given problem area has not yet been developed. Accordingly, a special contribution of the paper can be seen in removing the identified research gap.

POSSIBLE APPLICATION OF SSM IN IMPROVING INNOVATIVENESS IN HIGHER EDUCATION

Relying on previous considerations, a rich picture of the given problem situation can be built, as the first stage of the SSM application in improving innovativeness in higher education. On that note, based on the review of relevant literature and the results of previous studies, as well as on perceptions of the researchers themselves, the rich picture of the problem situation—improving innovativeness in higher education—was created (Figure 1). The rich picture encompasses the key stakeholders, their perceptions and interactions, such as students, employees of HEIs, university and faculty management, international cooperation of HEIs (expressed, for instance, in student and staff mobility), student organizations, labor market, local and state administration. The aim of creating rich picture is to capture the main entities, structures and viewpoints in the situation, the processes going on, the current recognized issue and any potential ones. As we can see from the Figure 1, various stakeholders differently perceive innovativeness in higher education. For instance, local and state administration’ concerns are related to the rules and procedures adopted on the national level, such as respecting the National strategy for higher education in which the key premises of innovativeness and its improvement are embedded. This strategy is also harmonized with the intentions of European Union to become innovation union. Management at universities and faculties can observe innovativeness through the lenses of continuous evaluation of teachers and reward system, which would stimulate innovativeness. Actually, mutual interactions between
management at universities/faculties and local and state administration can point to the need that implementation of the national strategy and procedures for higher education should be enabled at faculties/universities, but also that some good practices should be involved in national procedures. Teaching and nonteaching staff through their interactions with students, management at faculties/universities and businesses may perceive innovativeness as a mean for continuous improvement of quality of teaching and learning, improving creativity and entrepreneurial skills of students, etc. The relations among students, labor market and business are also emphasized in the Figure 1. They indicate the importance of business-academia collaboration, gaining knowledge and competences according to the labor market's requests, as well as the possibility to students adopt practical knowledge (e.g. through obligatory internship programs). Moreover, Figure 1 stresses the importance of students and staff mobility for improving innovativeness in higher education. Exchanging knowledge, experiences and practices, may results in better innovativeness through adopting new courses, teaching and learning methods, ways of students' assessment, etc. Therefore, Figure 1 presents a tool to encompass diverse perceptions, interests, opinions of stakeholders and their multiple relationships as well, i.e. a way of capturing impressions and insights. In fact, it represents innovativeness in higher education as a system of subjective people perceptions, i.e. as mental constructs of people involved in the problem situation. According to the rich picture presented (Figure 1), we can set the root definition, as a proper concise description of the system of improving innovativeness based on a specific world view. In order to facilitate the formulation of the root definition, the CATWOE analysis was used.

In this way, the following six components were identified:

C (Customers) – students, economy, society as a whole
A (Actors) – higher education institutions
T (Transformation Process)– traditional higher education institutions – transformation process – innovative higher education institutions
W (Weltanschauung) – modern higher education institutions function in circumstances where there is a pronounced significance of innovativeness in accordance with the EU’s efforts to become an innovation union
O (Owners) – employees in higher education institutions
E (Environmental constraints)– restrictive legal regulations, financial constraints
The root definition from the presented CATWOE could be set as follows:

**Relevant system:** A knowledge-based system that involves a strategic approach to innovation along with intensive cooperation of HEIs with external stakeholders, new models of organizational structures, innovative organizational culture, continuous training and development of employees in HEIs, as well as greater participation of students in decision-making, which contributes to improving innovativeness and efficiency of higher education institution as a basis for sustainable development.

The next step in the implementation of SSM is to build a conceptual model. Since the elements of the conceptual model are verbs, the modeling technique is reflected in the compilation of a minimal list of verbs denoting the activities necessary in the system described in the root definition, as well as in structuring the verbs in a logical order (Checkland, 1996, 170). The conceptual model is presented in Figure 2. Actually, conceptual model defines and links the activities needed to achieve transformation process. As the most common error in building the conceptual models is modelling the current practice which cannot enable valid comparison phase and discussion, we have started from defined root definition and singled out the following relevant activities in improving innovativeness: redefining the policy and strategies for innovation, identifying the activities for improving business-academia collaboration, developing new models of organizational structures at universities, specifying the activities to encourage students and teachers innovativeness, as well as activities needed to change organizational culture and to adopt innovative organizational culture. Also, model includes monitoring and control activities along with the defining the main criteria for assessing innovativeness in higher education. On that note, we emphasized the contribution to sustainable development as a criteria for effectiveness and cost/benefit analysis as a criteria for efficiency. This model can help in deepening our understanding of the situation and beginning to learn way to taking actions to improve problem situation. It is a device which is a source of good questions to ask about the real situation and ensures structured discussion about the situation, how it could be changed, which will eventually lead to action being taken.

According to the above, we can conclude that the given conceptual model represents a system by which innovativeness in higher education can be improved. Comparing conceptual models with reality should result in discussion about changes that will improve the problem situation.

With respect to the listed characteristics of the current state of innovativeness in higher education (Lašáková et al., 2017), the debate on possible changes should lead to identifying the proper systemically desirable and culturally feasible changes, as the outcome of the comparison of the conceptual model with the current situation. From conceptual model we can define a set of questions to ask. These are as follows: Does some activity exist in the real situation? Who does it? How does it? When does it? How else could it be done?, etc. Since this type of discussion was not conducted in real conditions, systemically desirable and culturally feasible changes have been identified, based on the comparison of interpreted results of previous research on the current situation in HEIs with the activities identified in the conceptual model.
Changes in their nature may vary: changes in structure, changes in procedures and changes in attitudes. So, we propose several systemically desirable and culturally feasible changes. First of all, structural changes can refer to changes in organizational structure at universities that include the introduction of new organizational units in charge of innovation, such as, for example, the development of university spin-offs (Babić & Savović, 2015), changes in the reporting structure and the structure of responsibility. Procedural changes concern dynamic elements, such as changes of regulatory framework (e.g. accreditations procedures), changes in reporting and information process, decision-making process (for example, greater participation of students in the decision-making process), and the like. Changes in attitudes involve flexible and innovative organizational culture, fostering teamwork and interdisciplinary cooperation. This type of changes also relates to changes in expectations that relevant stakeholders have from improving innovativeness in HEIs. However, it often happens that the identified changes are not implemented in reality or that they are not sufficiently implemented. Therefore, monitoring and control activities have the key importance, but also the assessment of effectiveness of implemented innovations envisaged by the conceptual model.

**DISCUSSION AND IMPLICATIONS**

Of relevant importance is to take into account that it is only potential application of SSM in improving innovativeness in higher education. It would be more beneficial if we could implement this approach in real circumstances. Though, limitation of the paper concerns the fact that the current state of innovativeness in higher education is assessed on the basis of the literature review and the results of previous studies, and not on the basis of an original empirical research. In this regard, the subject of future research is the assessment of the current situation at the universities in the Republic of Serbia and Slovenia and its comparison with the elements of the conceptual model, with the aim of defining systemically desirable and culturally feasible changes that will lead to improving innovativeness in HEIs. One of the possible ways of assessing the current situation is empirical research based on primary data collection through distribution of the questionnaires to relevant stakeholders, as well as on the secondary data analysis.

Hence, comparing the so identified current state with the elements of the conceptual model should trigger a certain discussion on systemically desirable and culturally feasible changes between the relevant stakeholders. Even if such discussion would be allowed, a question on real participation of stakeholders may be posed, given the different power they possess. This implies the need for a combined application of SSM and specific emancipatory systems approaches, such as Critical Systems Heuristics (Ulrich, 1994) in improving innovativeness in higher education.

Regarding the effects of proposed approach to innovativeness in higher education we can stress that SSM articulates a learning system that challenges existing ways of seeing and doing things, and can lead to some shifts in worldviews, opening up new proposals for change. In comparing to some alternative approaches, such
as hard systems approaches (classic Operational Research, Systems Analysis or Viable System Model), SSM incorporates the concept of conflicting worldviews which characterizes all social interactions. According to Zlatanović (2016), the key differences between hard systems approaches (HSA) and SSM as a representative of soft systems approaches are reflected in the interpretation of the system concept itself, theoretical assumptions and methods used, as well as in principles of acquiring knowledge. The HSA regards the system as an objective part of reality. On the other hand, the SSM regards the system as an epistemological concept subjectively constructed by people rather than an objective entity in the real world. In addition to this, the HSA and the SSM are based on different theoretical assumptions and use different analysis methods. The HSA assume that a system should have a well-defined structure and a well-defined objective. However, this kind of thinking implies optimization and cannot solve complex social problems because it ignores different perceptions, values and interests existing in organizations. On the contrary, SSM is not focused on a single well-defined problem, but rather on problem situations as the systems of problems. The focus is on improvement, rather than optimization, i.e. the focus is on the learning process. Finally, the HSA and the SST are based on the different principles of acquiring knowledge, i.e. they use different epistemological approaches. The HSA regard the system intervener as an outsider of the system. Therefore, the HST corresponds with traditional epistemology employing the principle of division between the subject and the object of research. On the other hand, SSM respects the interaction between the observer, as the subject of the research, and the problem situation, as the object of the research. Accordingly, the observer is involved in the observed situation. Actually, in SSM social world is observed as very complex, problematical continually being created and recreated by people thinking, talking and taking action. We can conclude that in SSM concept of systemicity appears in the process of inquiry into the world, rather than in the world itself. This shift makes a difference between hard and soft systems approaches (Reynolds and Holwell, 2010).

Utilization of SSM methodology to address innovativeness in HEI may have following theoretical and practical implications. Regarding theoretical implications, we may outline several possible components of HEI, which should be taken into the consideration when dealing with drivers and barriers or more broadly with innovativeness in HEI. This can for instance, be like institutional framework (modern ICT, government “support”, accreditation standards; structurual/procedural factors, organizational culture); intellectual capital (knowledge, upgrading knowledge, in-service training) and diverse aspects of innovativeness in HE (e-learning, flexibility, students can choose subjects, on-line teaching materials, stimulating of students, mobility of students, co-developing the curricula). Turning to practical implications, utilization of outlined areas in frame of empirical examination will enable various entities involved in HEI, for instance assessment of key drivers and barriers of innovativeness in HEI, identification of current state of innovativeness in HEI from various standing points, etc. These cognitions provide fertile ground for future decisions of HEI about how to improve their innovativeness and possibility for fine tuning of single elements of innovativeness in HEI.

**CONCLUSION**

On the basis of the overall consideration in the paper, we can drawn the following conclusions: SSM represents an appropriate means of introducing a structured systems thinking into a certain course of events and actions, which adjusts the various assessments of the investigated problem situation and introduces the proper models of the system. Due to different practical experiences regarding the use of SSM, the following conclusion can be drawn: SSM provides a structured way of identifying and involving different views of relevant stakeholders, highly applicable ideas, stakeholders who are open to new ideas and conflict mitigation, but also more willing to listen to alternative approaches and to adopt them.

In that sense, the key contribution of the paper consists in the introduction of SSM as an appropriate holistic approach to improving innovativeness in higher education, the application of which has not been identified so far. In point of fact, conducting research on improving innovativeness in higher education within the conceptual framework of SSM and using its key tools provides a comprehensive review of the given problem situation and possibilities for its improvement. Using our cognitions will be beneficial for addressing some of current challenges of innovativeness in HEIs, like improving cooperation between academia and economy (Potočan et al., 2016), where activities of HEIs should be oriented on establishing tighter connections, for instance in initiatives for solving actual problems of organizations, by including students in project work.

**REFERENCES**


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**SISTEMSKI PRILAZ UNAPREDENJU INOVATIVNOSTI U VISOKOM OBRAZOVANJU**

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Rezime

Respektujući značaj inovativnosti za ostvarivanje konkurentne primalnosti i održivi razvoj savremenih organizacija, u radu je fokus na inovativnosti visokoobrazovnih institucija i mogućnostima njenog unapređenja. Slodno kompleksnoj i pluralističkoj prirodi istraživanog problemskog područja, primenjen je odgovarajući holistički prilaz unapređenju inovativnosti u visokom obrazovanju. Zapravo, inovativnost u visokom obrazovanju je postavljena u koncepcijskom okviru Metodologije soft sistema (MSS). Kao odgovarajuća interpretativna sistemsko metodologija, MSS nastoji da obuhvati različite percepcije realnosti, olakšavajući na taj način proces učenja u kome su različita shvatanja ispitana i diskutovana na način koji dovodi do osmišljene ciljevne unapređenja i unapređenja. Iako predstavlja jednu od najšire upotrebljavanih sistemskih metodologija, još uvek nije primjenjena u problemskoj oblasti unapređenja inovativnosti u visokom obrazovanju, što predstavlja odgovarajući istraživački gap. U prevazilagošću navedenog istraživačkog gapa, u radu su korisčene bogate slike, izvorne definicije i konceptualni modeli, kao relevantni instrumenti MSS-a. Na taj način, identifikovane su različite percepcije relevantnih stavkih problema o unapređenju inovativnosti u visokom obrazovanju, kao i mogućesistemiški poželjne i kulturalno izvodive promene kojima se može unaprediti inovativnost visokoobrazovnih institucija. Dakle, istražujući inovativnost u visokom obrazovanju u koncepcijskom okviru MSS-a i koristeći njene ključne instrumente obezbeđeno je sveobuhvatno sagledavanje date problemskih situacija i mogući načini njenog unapređivanja. Međutim, važno ograničenje se tiče činjenice da je tekuće stanje inovativnosti u visokom obrazovanju procenjeno na bazi pregleda literature i rezultata prethodnih istraživanja, a ne na bazi originalnog empirijskog istraživanja. U tom smislu, predmet budućih istraživanja je procena tekućeg stanja na univerzitetima u Republici Srbiji i Sloveniji i njihovo poredenje sa elementima konceptualnog modela, u cilju definisanja sistemski poželjnih i kulturalno izvodivih promena koje će dovesti do unapređenja inovativnosti na visokoobrazovnim institucijama. Jedan od mogućih načina procene tekućeg stanja je empirijsko istraživanje zasnovano na prikupljanju primarnih podataka kroz distribuciju upitnika relevantnim stakeholder-ima, kao i na analizu sekundarnih podataka.

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