

DEVELOPMENT OF STRATEGIC FRAMEWORK FOR SUPPORTING HIGHER EDUCATION GRADUATES' EARLY CAREERS

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Abstract

Due to the high unemployment rate of young people, there is a strong emphasis on the issues/policies regarding the employability of young people on level of the European Union. Additionally, the enhancement of graduates' employability is one of the criteria for the majority of university rankings. Accordingly, at the level of the European Higher Education Area (EHEA), strengthening the potential employability of young people was set as one of the key development priorities. The closer cooperation between education, businesses, entrepreneurial sector, employment services and other stakeholders became one of the strategic goals until 2020, in order to ensure better graduates' employability. In that context, not only the quality of study program, but also the support activities and services available to students are of great importance. The goals of this research are to explore how different elements of student support system are currently organized at European universities and to develop a strategic framework with the accompanying maturity model for supporting higher education graduates' early careers in the field of information and communication technologies (ICT). This paper presents the research steps in the development of strategic framework with accompanying maturity model, following the design science principles.

Keywords: graduates' employability, maturity model, career development, HEI.

1 INTRODUCTION

In the last few years, at the European Union (EU) level, the employability of highly educated young people and their preparation for the transition to the labour market within higher education institutions (HEI) is a common issue [1]. Accordingly, at the level of the European Higher Education Area (EHEA), strengthening the potential employability of young people was set as one of the key development priorities. The relevance of this topic arises from the European Union key strategies for the period between 2014 and 2020, which particularly emphasizes the importance of education and innovation [2]. One of the Europe 2020 initiatives, *Youth on the move*, puts special emphasis on the "modernizing agenda of higher education (curricula, governance and financing) including the benchmarking university performance and educational outcomes in a global context", as well as "building national qualification frameworks and better gearing learning outcomes towards labour market needs" [3]. Taking into account the current national strategy for Education, Science and Technology of the Republic of Croatia [4] - which states building a system of career guidance for students in cooperation with businesses, entrepreneurial sector, employment services and other stakeholders, in order to contribute to better profiling of students and ensuring better connections between education and the labour market as one of its aims - it can be concluded that the employability of higher education graduates is a very relevant area of research. In this framework, the latest European priorities for collaboration in the field of education can be recognized, stressing the importance of integrated framework including education and training at all levels [5].

Besides teaching and research, being their core mission, universities are seen as catalysts of knowledge economy and social growth. Therefore, in the last decades, universities are associated with their third mission, which generally includes all the activities not covered within mission of teaching and research [6]. While some authors understand the third mission as a commercial engagement [7], the others [6] explain it as a broader concept, contributing to the knowledge for the social, cultural and economic development in the following dimensions: Technology transfer & innovation, Continuing education and Social Engagement. The latest European strategies and policy documents, emphasize the strategic role of universities in preparation of employable graduates that will contribute to the development of the society as whole. Therefore, preparing graduates for their early careers should be one important dimension of universities' 3rd mission, in order to remain competitive at the dynamic market.

There are several reasons why the focus of this research will be on the education of future ICT professionals, although the strategic framework will be applicable to the educational institutions in different fields. The European Union has recognized the lack of ICT skills and the several hundred thousands of unfilled ICT-related vacancies as an issue and thus has launched the *Grand Coalition for Digital Jobs* within the *Digital Agenda for Europe*, an initiative aimed at “increasing the overall supply of digitally skilled professionals and to better match supply and demand of digital skills” [8]. This coalition is aimed at solving the problems previously identified in numerous researches – to make the ICT careers more attractive, to align curricula at different level of education with the needs of industry, to reduce labour market mismatches, to stimulate the recognition of qualifications of ICT professionals, based on the existing e-Competence framework etc. Moreover, the ICT sector is directly responsible for 5% of the European GDP [8] and the predictions about future trends in ICT professional jobs and demand in Europe until 2020 presents three different scenarios - in all three cases, the demand potential exceeds the predictions about the number of ICT graduates [9].

To argument the scientific relevance of the planned research, the authors conducted a systematic literature review of publications related to the education and career development of future professionals in the field of ICT. The literature review included altogether 7179 papers available in the following databases: IEEE, ACM, SCOPUS, ScienceDirect and Web of Science (WoS). The analysis included 10 research questions related to curriculum, competencies, teaching methods, cooperation with employers, employability and career development of higher education graduates. The initial results of meta-analysis provided by the authors of this paper (work in progress) show that there is a very low proportion of papers (16%) proposing the ways to improve the employability of graduates, although many authors (51%) point out the problems related to the employment of higher education graduates in the field of ICT, and the need for improvement in this context.

Therefore, the main goal of the planned research is to explore the system of support mechanisms for early career development of graduates within higher education institutions. The main output of this research proposal will be the strategic framework for supporting higher education graduates' early careers with the accompanying maturity model applicable to the education of future ICT professionals. The phases of strategic framework and maturity model design will be presented in this paper, along with the introduction of the initial strategic framework.

2 RESEARCH BACKGROUND

2.1 Strategic Planning In Higher Education

To better align institutions with the external environment and to accomplish their mission, a strategic planning should be practiced [10]. Strategic planning can be defined as *a set of concepts, procedures and tools designed to assist leaders and managers* [11] in achieving organizations' mission and goals and is accompanied with the strategic decision-making. Some authors [12] propose four-step strategic decision making cycle, following the so called Deming PDCA (plan-do-check-act) cycle through the following phases: 1) Identification and research of the problem, 2) Design and decision making methodology, 3) Implementation and monitoring of strategic decision and 4) Evaluation of the effects of strategic decision. The cycle of the strategic planning can be observed at different levels of strategy (Fig.1), from strategic vision to strategic blueprint [13].

Although there are some examples of strategic planning in higher education in the existing literature, like the strategic planning for the implementation of e-learning in higher education [12], the work on strategic planning for enhancing graduates employability is missing. Therefore, this research puts focus on the strategic guidelines and strategic framework (Fig.1) that should help HEIs in defining a more specific targets and actions in the form of strategic roadmap and blueprint regarding the employability of its graduates.

Strategic Vision	Rough sketch of desired long term future
Strategic Guidelines	Broad principles setting general direction
Strategic Framework	Outline of main objectives and initiatives
Strategic Roadmap	General plan of targets, actions and roles
Strategic Blueprint	Comprehensive plan detailing most activities

Fig. 1. Levels of strategy specificity [13]

One type of models sharing the common characteristics with strategic framework is the maturity model. The authors of a comprehensive maturity model [14] proposed in the complex area of e-learning stress that the assessment of capability in such a complex area as e-learning involves *reducing large amounts of detail into a broader overview that supports management decision making and strategic planning*. This direct connection between the maturity models and strategic planning supports the authors' intention to develop a maturity model for supporting higher education graduates early careers as an addition to the strategic framework.

2.2 Maturity Models

Maturity models (MM) provide an instrument for the transformation process from the initial stages of some complex phenomena, to their optimal stages [15]. Accordingly, the term „maturity“ itself implies evolutionary progress in the demonstration of specific ability or in the accomplishment of a target from an initial to a desired end stage [16]. Generally, maturity models consist of “a sequence of levels/stages that together form an anticipated, desired or logical path from an initial stage to maturity”[17] and they basically “represent theories about how organizational capabilities evolve in stage-by-stage manner along an anticipated, desired, or logical maturation path”[17].

The first and the most popular model of this kind, Capability Maturity Model (CMMI) launched by Software Engineering Institute [18], provides a roadmap for the improvement of process capabilities and a tool for benchmarking. Since then, the maturity models have been proposed by researches across different domains such as software processes [19], project management [20][21], IT management [22] [23], knowledge management [24] and business process management [25]. The analysis of 237 articles [26] extracted 20 domains in which the MM was applied within current researches. Among others, they are found to be applied in educational organizations as well [27].

The basic purpose of maturity models is describing the levels and maturation paths, but for their application in practice it is also necessary to discover current and desired maturity levels and to include adequate measures, according to the descriptive, prescriptive or comparative purpose of a certain maturity model [16]. As such, maturity models serve as a useful benchmarking tool. In this paper, the logic of maturity models will be applied to discuss design of a tool for a higher education system, with the focus on its role in preparing graduates for their future early careers.

As one of the reasons for the use of maturity models, some authors [16] stress the pressure on organizations to retain competitive advantage, reduce costs, improve quality of products or services etc. In the terms of higher education, there is a certain pressure on higher education institutions, evident from the key strategies and policies at EU and national levels, to educate graduates that will be employable after the graduation. In that sense, the capability of a higher education system to provide support services in early career development being highly mature and able to contribute to the better employment of graduates, is of high importance.

3 RESEARCH STEPS

The research will be carried out in several steps involving predominantly qualitative research methods, and to a lesser extent quantitative methods, which characterizes a mixed method research according to [28]. In this research, the design science research paradigm [29] will be applied, as it is the common approach for the design of maturity models. Design science (DS) is a problem solving paradigm

centred on building and evaluating innovative artefacts to solve complex, real world problems, make research contributions that extend the boundaries of what is already known, and communicate the results to appropriate audiences [22]. The research will be conducted following the guidelines of design science [30], within three main research cycles: relevance cycle, rigor cycle and design cycle (Fig. 2). The relevance cycle includes individuals, groups and other stakeholders related with the system and seeks requirements in the contextual, real-world environment of the problem. In opposite, the rigor cycle contributes to the design of artefacts based on the literature review and other knowledge sources. In the context of this research, relevance can be perceived from the elaborated strategic documents stressing the need for better employability of graduates. To create the initial strategic framework, the existing theoretical foundations will be used as a part of rigor cycle, but the exploratory empirical investigations are welcome in order to avoid the risk of building an erroneous initial model based only on the existing literature [31]. Therefore, the initial framework created on theoretical assumptions will be, within the relevance cycle, amended with the results of case study research conducted according to methodology proposed by Yin [32]. The first case study research has already been conducted at the Faculty of Organizational Sciences, University of Belgrade, and there are at least three more research case studies to be performed at other European universities while from less than 4 cases it is difficult to generate a theory [33]. The set of artefacts created during the relevance and rigor cycle needs to be evaluated and justified until they “work well for the specified class of problems” [30] so it is important to stress that the initial model will be upgraded through several more phases, respecting both principles of rigor and relevance cycle in design.

Fig. 2. shows the adapted [30] [31] design science research approach to the development of strategic framework and maturity model of supporting graduates in their early career that will be created as a result of proposed research.

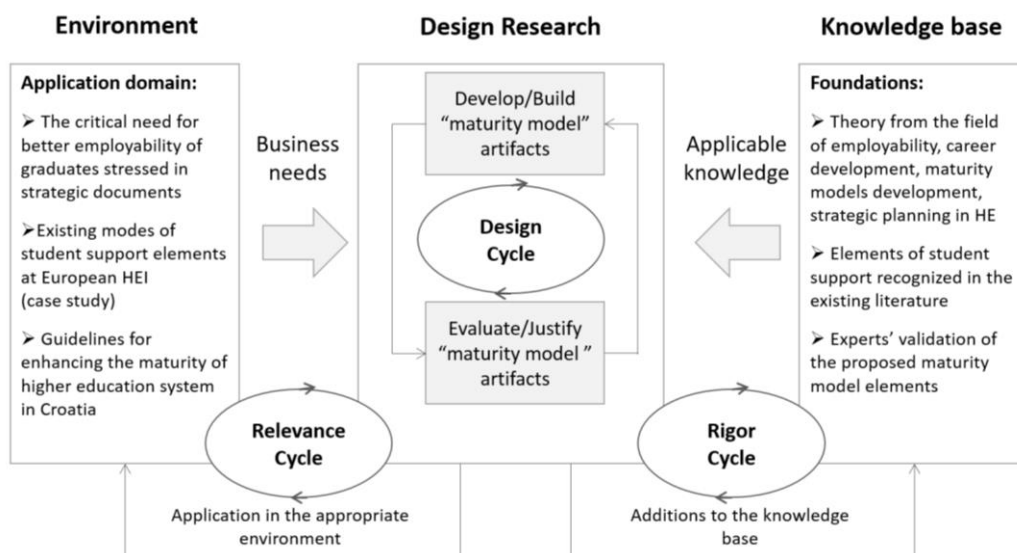


Fig. 2. Design science framework for the development of strategic framework and maturity model of supporting graduates in their early career adapted from [30][31]

Although the maturity models are well represented in the existing literature, there are only few articles that propose design process of maturity models. Mettler [34] examined three available design methodologies and, based on their similarities and differences, proposed the five step design methodology to develop the maturity model that will be applied in this research, as shown in Fig. 3: 1) Identify need or new opportunity, 2) Define scope, 3) Design model, 4) Evaluate design and 5) Reflect evolution. Similar phases, including 1) Intelligence phase, 2) Design phase, 3) Choice phase and 4) Implementation phase, can be found in strategic decision-making about e-learning implementation [35], confirming the elaboration of connectivity between strategic planning and maturity models. Following those steps, this paper contributes to the research in the field of strategic framework and maturity models development, in line with the design science principles. The initial strategic framework, as presented later in this paper, represents the partial results of phase 2 (*Define scope*) which resulted with the definition of the basic elements of strategic framework and maturity model.

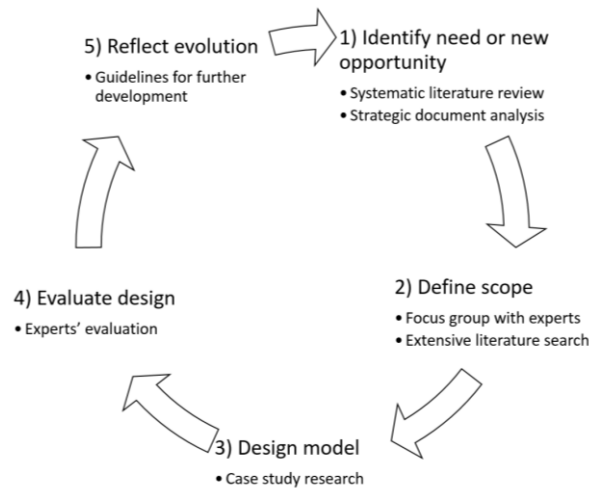


Fig. 3. Steps in strategic framework and maturity model design according to [34]

4 INITIAL STRATEGIC FRAMEWORK

As the main part, this paper will present the initial framework for supporting graduates' early career development within higher education institutions (HEI). Usually, maturity models refer to processes, however for assessing the maturity of organizational design they should use the processes' perspective as well as, people's and objects' perspective [16], which makes models multi-dimensional. Generally, the basic elements of maturity models, with parallel to the CMM, are [34]:

- number of levels
- descriptor to each level
- generic description or summary of the characteristics of each level as a whole,
- number of dimensions
- number of elements or activities for each dimension and
- description of each element or activity as it might be performed at each level of maturity.

The rest of this chapter brings the description of the initial strategic framework and maturity model elements.

4.1 Strategic Framework Elements

4.1.1 Key Process Areas

Institutional capabilities are usually divided into several major categories called also the **process areas**. This building blocks indicates the main areas an institution should focus on, in order to improve the support for the employability of its graduates. The identification of the key process areas is not straightforward since all of the processes are interrelated to some degree. Each process area contains several **processes**.

For the purpose of this research, focus group technique with relevant stakeholders was applied in order to determine key process areas of higher education system important for supporting and enhancing graduates' employability. Focus group participants were experts with rich experience in leading the higher education institutions (faculties and universities), as well as different stakeholders of higher education system, being research team members of the project *Development of a methodological framework for strategic decision-making in higher education – a case of open and distance learning (ODL) implementation* financed by the Croatian Science Foundation. Focus group was performed during the workshop *Strategic planning within Higher Education*, held in Varaždin from 9th to 11th July 2015 when 12 participants were divided to work in two groups. The purpose of this focus group was to determine all the relevant elements of higher education system contributing to the employability of its graduates and to help in shaping the further research. The following two research question were set to lead the focus group discussion:

1. According to your experience and professional knowledge, which are the most important HEI's key areas (activities, structures, processes, actors...) in preparing students for their early careers?
2. Who are the key persons at your institution that could help in determining all the elements contributing to students' employability?

The participants were divided in two groups to work for 30 minutes in the form of moderated discussion. The discussions were moderated by the authors of this paper. Before conducting the focus group, the consultations between moderators were held in order to reconcile the rules for moderating discussion. Additionally, before the focus group, a short presentation was held, to introduce the experts to research topic and research plan as well as the purpose of focus group tasks. As a result of focus group work, there are seven key areas that both groups independently recognized as important: *Strategy, Curriculum, Support Services, Alumni Relationships, Quality Assurance, Teachers and Research & Development*. The Group 2 recognized two more areas, *Infrastructure and Extracurricular activities* that should be further analysed in order to decide whether they should be observed as separate key areas or as a part of one of the seven analysed.

4.1.2 Dimensions of Capability

The main concept of each maturity model is the capability. In this context, **capability** describes the ability of an institution to ensure that the education and services provided for students support and enhance the development of employability skills and their employment upon graduation. The organizational capability is described through **dimensions of capability**. In the original CMM dimensions of capability are represented in hierarchical maturity levels, from initial, repeatable, defined and managed to optimized level. In this way, capabilities are assessed in a layered and progressive manner. A more holistic capability approach can be found in e-learning maturity model (eMM), where dimension of capability are described in a synergistic manner, including *Delivery, Planning, Definition, Management and Optimization*. This synergistic approach implies that an organization has introduced holistic approach, it means that the developed capability on all dimensions for all processes, will be more capable than one that has not. Furthermore, strong capability on a particular dimension not supported by capability on other dimensions will not lead to a success of the desired process outcomes. From the maturity point of view, it can be said that the organization is on a higher level of maturity if it is highly capable at all the dimensions. Following the synergistic logic of organizational capabilities [36] and starting from the idea of maturity model as a strategic framework, we propose dimensions of capability based on the Deming PDCA cycle with four phases that are repeated iteratively, as shown in Fig. 4 [37].

Dimension 1 - Plan	Consider assessment of predefined plans in conducting the work of process. Definition and systematic planning of activities contributes to a greater success in goals realization.
Dimension 2 - Do	Concerned with the creation and delivery of process outcomes. Higher capacity in this dimension with the absence in other three dimensions increases the risk of failure or unsustainable delivery.
Dimension 3 - Check	Includes institutional capabilities for managing the process implementation, including evaluation (measurement) of gained results and validation (control) of goal realization.
Dimension 4 - Act	Reflects a culture of continuous improvement of processes through the elaboration of new ideas and solutions for improving the capability measures within the other dimensions of this process in next cycle.

Fig. 4. Description of dimensions of capability based on Deming PDCA cycle, adopted by [37]

Let us provide an example of how this approach affects the overall maturity of a higher education institution in supporting and enhancing the employability of its graduates. For example, if the HEI provides a certain support for students' extra-curricular activities, but without any plans for their implementation, and without the evaluation mechanism, the overall maturity for that process will be lower.

4.1.3 Practices

At the lowest level of observance within strategic framework, each process is broken down within each dimension into **practices** that describe how the process outcomes might be achieved by an institution. Those practices could be either essential for the successful achievement of a certain process or just

useful in supporting the outcomes of a particular process. For the purpose of this research, a distinction between the essential and useful practices would not be made, but rather all the relevant ones will be detected. The initial list of practices is based on the review of relevant documents showing the best practices, such as universities' strategy, quality assurance policy, graduates' employability strategies etc., as well as the detailed eMM process descriptions [38], and initial case study research conducted at the University of Belgrade, Faculty of Organizational Sciences.

4.1.4 Capability assessment criteria

The purpose of **capability assessment criteria** is to rate each practice of a certain process area for the performance on a pre-defined scale that could be either qualitative or quantitative but always measurable. In this model, we will adopt the eMM scale with the values as shown in Fig. 5.

Level 1	Not assessed
Level 2	Not practiced / Not adequate
Level 3	Partially adequate
Level 4	Largely adequate
Level 5	Fully adequate

Fig. 5. Capability assessment criteria, adopted from [38]

4.2 Initial strategic framework

Following the definition of both strategic framework and maturity model, as well as their main elements, we propose the relationship between those two, as shown in Fig. 6, where the additional element contained in maturity model refers to the *capability assessment criteria* of different practices.

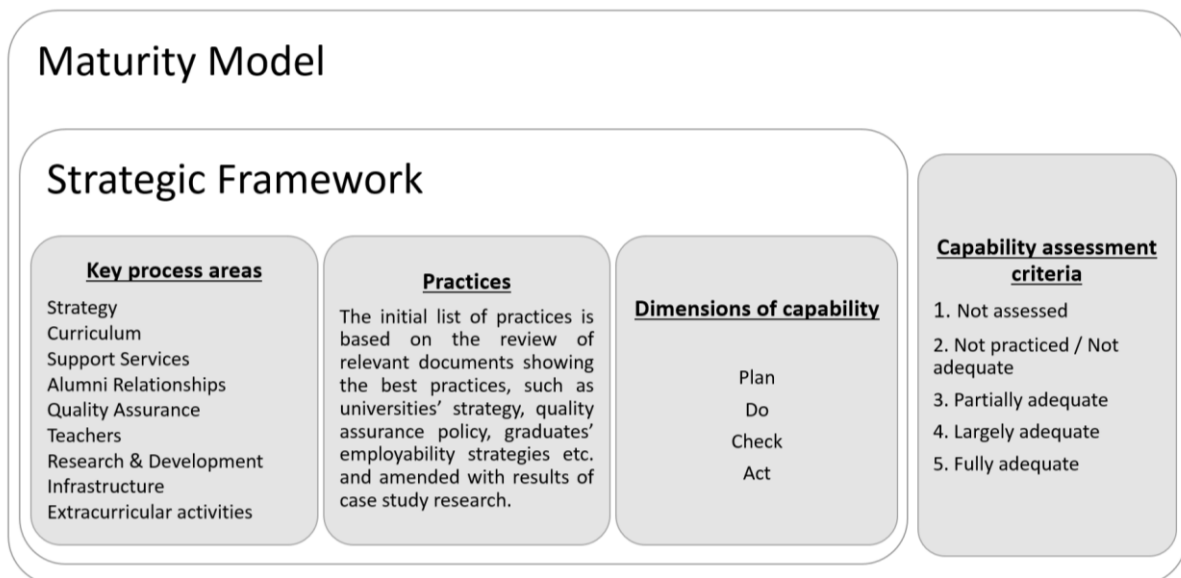


Fig. 6. Relationship between strategic framework and maturity model

This initial framework is based on the strategic planning principles and created as a result of the following research steps: systematic literature review, focus groups with experts (decision-makers in HEI from different HEI's, teachers, representatives of employers, students/alumni) and case study research conducted at Faculty of Organizational Sciences, University of Belgrade.

5 CONCLUSION AND FUTURE STEPS

This paper presents the research steps in the development of strategic framework with accompanying maturity model for supporting higher education graduates early careers, following the design science principles. There are five steps in design methodology to develop the maturity model: 1) Identify need or new opportunity, 2) Define scope, 3) Design model, 4) Evaluate design and 5) Reflect evolution, which are also in line with the strategic decision-making steps. The initial framework presented in this paper (Chapter 4.2.) represents the results of the second step (*Define scope*) in the maturity model design process and provides a basis for the step 3 (*Design model*). In the terms of design science paradigm, the rigor cycle is fulfilled in this step as the initial model is created based on the extensive literature review and conducted focus groups with experts. Results of focus groups provided a list of key process areas which provide guidelines for further research of practices during case study research. The relevance cycle is fulfilled through the content analysis of relevant documents, showing the best practices at different universities, and initial case study results.

The results of this study also contribute to the understanding of a connection between strategic framework and maturity model in higher education, regarding the graduates' employability. Following the definition of strategic framework's main purpose as "outlining the main objectives and initiatives" [13], we propose the main elements of strategic framework for supporting graduates' employability as: *key process areas, practices and dimensions of capability*. Upgrading of this strategic framework with additional element *capability assessment criteria* resulted with the maturity model framework for supporting higher education graduates employability. Therefore, it is shown that five steps of maturity model design methodology proposed by [34] can also be applied to the development of a strategic framework.

As this paper proposes an initial framework, the conclusion brings the description of future steps to be done. At least three more case study researches will be conducted at different HEIs in Europe in order to complete the phase 3 (*Design model*). After designing the maturity model, the phase 4 (*Evaluation phase*) is very important, since it ensures its validity and the overall quality. In this process, the Q sorting method, which considers a group of experts evaluating certain model elements, is found to be suitable. The group of experts will be engaged in this step in order to test the content and construct validity of final model.

When finished, the research is expected to contribute to the systematization and increasing knowledge in the field of education and career development of future ICT professionals as well as the development of strategic framework for supporting higher education graduates' early careers with accompanying maturity model for the field of ICT that cannot be found in the scientific literature so far. In addition, regarding the scientific contribution, the results of the proposed research will have a significant social contribution with respect to their applicability for solving the current problems and challenges in higher education, in the form of guidelines and strategies for the design of processes and activities for supporting graduates in the early career. As a concrete societal contribution, the author will provide guidelines for enhancing the maturity of higher education system in Croatia regarding the education of future ICT professionals.

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