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Technological Opportunities for the Digitization of the Career Development Processes

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Abstract

The paper examines the issues of career development of students in the context of quality management of higher education. The better realization of graduating students is an important strategic goal for each higher school and its achievement ensures a better connection of education to the labor market. The better career orientation of the students during their studies makes the higher education institution more desirable by the candidate students and increases the funding process. A very challenging task in this context is the development of relevant technological solutions to be maximally digitized, which enables career development processes for students in higher education institutions. The study justifies this necessity by presenting and analyzing data related to the changes in the information channels and access to the students, as well as the cycle of their realization. The main contributions of the article are related to elucidating the causal relationship between career development and the quality of education, as well as the development of a common conceptual model for the digitization of career development. Finally, summaries are made and conclusions are drawn.

Keywords: digitization, information technology, career development, career centers, higher schools

JEL code: I23, L86

Introduction

In modern conditions higher education institutions in the Republic of Bulgaria are faced with the need to significantly reorient their activities towards achieving higher quality of education. In this context, the main objective of the present research is to provide technological opportunities for the digitization of career development processes, based on the study of the legal basis and analysis of statistical data, in order to orientate the training to the needs of the labor market. The defined main goal of the research gives grounds for defining the following sub-objectives:

- analyzing the regulatory base, related to the financing of the higher education system, focusing on the quality of education and the link with the labor market;
- analysis of empirical data from a conducted study on the main challenges for the career development of students;

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- developing and offering a conceptual model that outlines the technological possibilities for digitization of the main processes of career development of the students.

To accomplish these sub-objectives, empirical analyses must be carried out in several ways:

- presence and use of digital competences by students. The results of such data analysis will provide a backbone for expanding digital channels for access to information for students;
- the use of internet and digital channels by students about the search for job positions. This also applies to the search for forms of change of an already existing job position as an element of the career development lifecycle. Such data can serve as a basis for developing a common conceptual information model for the career center;
- the expanded application of the practical training as the basis for increasing the efficiency of the process of finding the desired job position by the students.

The main limitations of the study are:

- the relationship of career development and the quality of higher education is a study through the prism of the current regulatory regulation. These are Decree No. 328 of the Council of Ministers as of 30.11.2015;
- the conclusions are based on the results of the conducted empirical study. It is quite possible that there are other factors that determine the peculiarities of the career development of the students;
- the proposed conceptual model is based on the latest applicable technology solutions.

These analyzes and their results provide the conditions for achieving the respective sub-objectives and hence the main objective of the research.

1. Theoretical background

In world scientific literature, the problems studied have been widely reported. Career development of students is related to the realization of the labor market. It is a major factor in the development of every economy. The more graduates are graduates, the more innovative approaches can be applied to achieve an intelligent economy. The countries of the European Union have a number of peculiarities that are caused by public and political factors. This also makes a more specific analysis of the behavior of young people in their realization in the real sector. In a study Samardžija, Walker, and Bazdan (2017) identify the leadership potential among members of a student population and attempt to understand the background reinforcing such potential, as well as future aspirations of individuals who have it. To a great extent, in literature, building leadership is associated with mentoring. Luecke and Ibarra (2004) address the issue: how to develop top talent and achieve stronger performance. This study focuses on topics such as: Active Coaching and Follow-Up: Getting Down to Business; Becoming A Better Coach: Beyond the Basics; Mentoring and Management: Developing Human Assets; Being an Effective Mentor etc. The topic of developing leadership skills and better realization is also present in the research of a number of other authors. Karagianni, D., Montgomery, A. J. (2017) explore the development of leadership skills among teenagers and young people through a review of leadership programs. The authors identify the literature concerning young adults as leaders and examine the evidence base for the benefits associated with leadership programmes with young adults. In this study, we support the understanding that investment

in career guidance for young people is absolutely necessary. Practical training coupled with inclusion in special programs can develop leadership skills in young people and help implement the labor market. Some of the topic-related studies also considered the positive psychological interventions as a factor for career development of students (Panc, I. R., 2015). In this connection some authors (Velichkov, Stefanova, 2018) regard higher education as an investment in human capital. This requires investing efforts in research, analysis and development of strategies and concepts to improve career development opportunities for students. In this way the education at the respective higher education institution will be adequate and concretely linked to the realization of the labor market, which will increase the demand for educational services by the candidate students.

The quality of higher education in Bulgaria is a very often discussed topic. Interesting in this case is the development of the system of higher education institutions in the last 20 years and the exceptional diversification in the offered specialties for the students. Several higher education institutions have developed atypical trends and majors in market demand, which at some point leads to saturation and the need for change. The strategy for the development of higher education in the Republic of Bulgaria for the period 2014-2020 is designed because of the public will for seeking modernization and internationalization of higher education. This paper considers the basis for changes in the other related legal basis - laws, regulations, ordinances, etc. It states that "there is a lack of a robust system for obtaining objective feedback from employers on the quality of the knowledge and skills acquired by students during the acquisition of higher education." This in practice means that there is a serious information problem related to the career development of young people. Its essence is in measuring the direct and indirect effects of student labor market realization and the feedback system. The quality of knowledge, skills and competences should be measured through the prism of the users of the personnel. In this regard, some important studies by leading authors (Musov, 2017) link the expectations of practitioners of a profession to the technical competencies of candidates and note that the values of the profession should be mentioned.

2. The role of career development for improving the quality of higher education

Recognizing strategic documents and research over the last few years, government policy on funding for higher education has changed. It focuses primarily on establishing quality financing mechanisms. By Decree No. 328 of the Council of Ministers as of 30.11.2015 the state budget for the maintenance of the education in the state higher education institutions is determined depending on the complex assessment of the quality of the training and its correspondence with the needs of the labor market. This document defines a system of indicators and weight ratios that form an estimate used for funding needs. The indicators are summarized in groups. In view of the objective of the present research, the important group is named "realization and relation with the labor market", which has a share of 42% in the overall assessment. It includes the following indicators:

- application of acquired higher education and realization by vocation - 10%;
- insured income for graduates - 5%;
- unemployment among graduates - 15%;
- contribution to the social security system - 5%;

- ratio of the insured income of the graduates to the average salary for the district - 7%.

The creation of the indicator framework shows that career development and the realization of the labor market are decisive for both the general quality assessment of higher education and the funding received on its basis. This dependence is represented graphically in Figure 1.

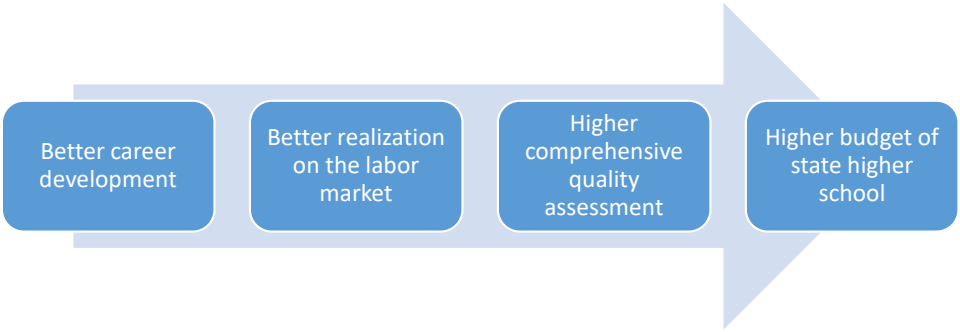

Figure 1. *Link between career development and quality and funding*

From the abovementioned it can be concluded that career development and the realization of the labor market occupy a very important place in determining the quality of training and its financing. This requires the development of procedural and technological solutions to improve the career environment for students. A very large part of this environment is managed by higher education career centers, which requires them to do their utmost to improve the administrative service provision of the students and to digitize the main processes. In this direction, some of the authors (Kirilova, 2018) examine and analyze the problems of administrative service delivery in the public sector and the need to reengineer the processes and services before their digitization. The main point here is the need to integrate existing software solutions and move towards a common digital infrastructure that is addressed in the next parts of the study.

3. Empirical analysis

Obtaining data on the implementation of practical training as a basis for the lifecycle of career development is carried out by conducting a specialized empirical study among students of the University of National and World Economy - Sofia. The questionnaire consists of 10 questions that are mainly related to the benefits of internships and practical training by students. This study aims to improve the processes and focuses on looking for the benefits of internships when getting job offers. The specific questions are:

- Q1. I have achieved the expected results during the practice;
- Q2. I learned new knowledge and skills, quickly entered the nature of the practice;
- Q3. I was able to organize my tasks in a timely manner;
- Q4. I met the deadlines for the tasks;
- Q5. I was able to cope with several tasks simultaneously, without affecting the quality of the performance;
- Q6. The acquired knowledge of the specialty helped to perform the tasks assigned during the practical training;
- Q7. The knowledge I acquire at the higher school in the specialty is enough for practice;
- Q8. During my practice I acquired new practical knowledge and skills related to my specialty education;

- Q9. Throughout my experience, I have acquired and developed the skills and abilities necessary for my realization in the labor market;
- Q10. Did the training organization offer you a job after the practice?

Each of the questions will be evaluated by respondents on a scale of 1 to 5, with 1 being the minimum score and 5 being the maximum score. The development and implementation of the current questionnaire presents several main objectives:

- gathering the necessary data for carrying out analyses and research;
- ensuring comparability of data for individual students;
- reducing the possibility of data distortion;
- using the results to formulate proposals for the digitization of career development processes.

The following formula shall be used to determine the volume of the sample (Mishev, 1998, p. 117, formula 7.26):

$$n = \frac{z^2 \times \sigma_p^2 \times N}{\Delta_p^2 \times N + z^2 \times \sigma_p^2}, \quad (1)$$

Where:

- n - volume of the sample;
- z - warranty multiplier;
- σ - standard deviation;
- p - relative share of a given metric;
- Δ - maximum permissible error;
- N - volume of the general population;

For the purposes of this study, the following values of the above parameters are adopted, namely:

- z (warranty multiplier) – at 95% warranty probability, which is usually used in economic studies, its value is 1,96;
- σ (standard deviation), which is obtained as $\sigma = \sqrt{p \times (p-1)}$, where p is a relative share of an indicator. If p= 0,5, σ^2=0,25;
- N (volume of the general population) = 18000 students.

From where it is calculated:

$$n = \frac{z^2 \times \sigma_p^2 \times N}{\Delta_p^2 \times N + z^2 \times \sigma_p^2} = \frac{1{,}96^2 \times 0{,}25 \times 18000}{0{,}0157^2 \times 18000 + 1{,}96^2 \times 0{,}25} \approx 3200 \text{ students} \quad (2)$$

With a sample size of 3,200 students, the maximum permissible error, which is about 0,0157, is permissible for this kind of research. Running a survey is a complex task. It requires strong organization and motivation of the respondents. This largely depends on the success of the applied statistical method. The volume of the sample is 3200 students. This represents about 18% of the general population. It can be considered that this sample size is sufficient for such type of research. The application of the statistical method consists of the following 8 steps (Figure 2):

- determining the parameters of the study;
- preparing a questionnaire;
- distribution of the questionnaire;
- receiving answers;
- encoding of the data;
- statistical processing of the data;
- results analysis.

The results obtained after the survey were processed for the purposes of the study and are presented in Table 1.

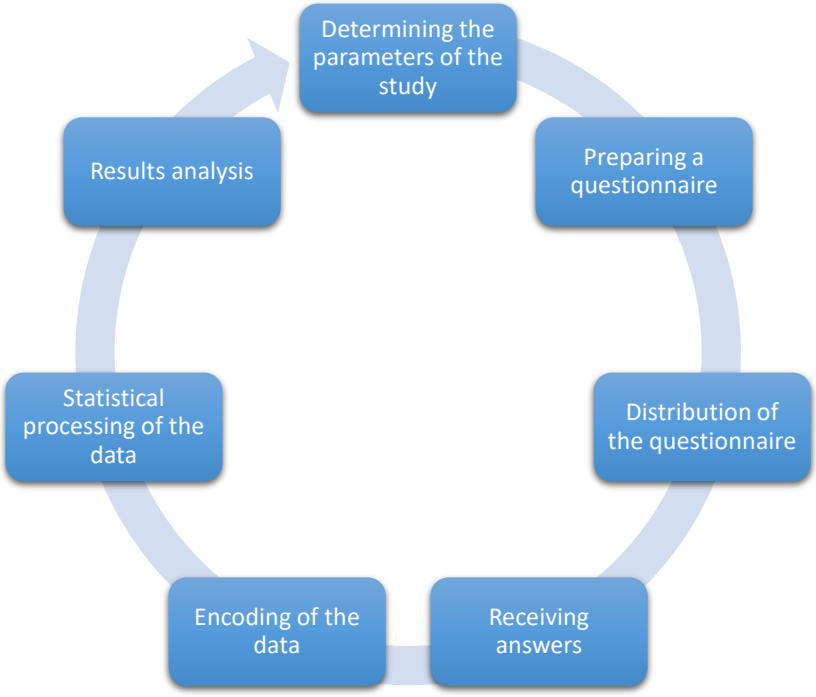

Figure 2. *Basic steps of applying the statistical method*

Table 1. *Received answers to the questionnaire*

Question / Result	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
5	2702	2707	2423	2664	1721	2252	1262	2663	2706
4	457	454	728	505	1239	793	1180	485	448
3	34	33	42	27	215	125	442	37	39
2	6	5	5	4	21	27	259	13	6
1	2	2	3	1	5	4	58	3	2

Regarding the first question "Q1. I have achieved the expected results during the practice", 2702 of the respondents have rated 5 and 457 have assessed 4. This means that most of the respondents are very satisfied with the results achieved;

- acquiring new knowledge and skills is one of the major challenges in running internship programs. It is a very important part of the lifecycle of career development. The answers received to the question "Q2. I learned new knowledge and skills, quickly entered the nature of the practice" are analogous to the first question, most of which correspond very positively. These data show that practical training is an important part of the upgrade process of acquiring knowledge, skills and competencies;
- the responses received to "Q3. I was able to organize my tasks in a timely manner" show a slightly different distribution. A fairly large number of 728 respondents indicated grade 4, which means that

students have little difficulty in forming daily plans for time and task allocation, which is natural given the accumulated theoretical knowledge so far;

- similar is the distribution of the answers to "Q4. I met the deadlines for the tasks". Here, interestingly, only 5 of the respondents indicated scores in the lower part of the scale (grades 1 and 2). It can be concluded that the students make every effort to meet the deadlines and positively evaluate their skills;
- the biggest differences in answers are in "Q5. I was able to cope with several tasks simultaneously, without affecting the quality of the performance". Here, a very large number of respondents have scored 4 - 1239, and the number 5 respondents being 1721;
- the largest number of respondents - 2252 persons have rated 5 in "Q6. The acquired knowledge of the specialty helped to perform the tasks assigned during the practical training". This shows that students appreciate very positively the acquired knowledge during their higher education in terms of performing assigned tasks in practice. The answers to this question are directly related to the next Q7;
- in the case of question "Q7. The knowledge I acquire at the higher school in the specialty is sufficient to practice" the answers have much more distraction. The answers with a score of 5 (1262) are almost equal to those with 4 (1180). This shows some hesitation in the respondents about the quality of the acquired higher education and its applicability in practice, which is directly related to the objectives of this research. The data suggest that higher education institutions should do their utmost to link and synchronize students' knowledge with labor market needs;
- the data that was obtained on "Q8. During my practice I acquired new practical knowledge and skills related to my specialty education" show a predominant assessment of 5. Similar are the answers to a question "Q9. Throughout my experience, I have acquired and developed the skills and abilities necessary for my realization in the labor market", the respondents are very satisfied with the acquired skills during the practice;
- very interesting are the answers to "Q10. Did the training organization offer you a job after the practice?". The answers show the direct link between traineeships and labor market realization. Some 22.71% of the respondents (727) have been offered a regular job position during the practical training. The answers to this question point to the search for opportunities to improve career development processes with a view to getting a regular job position for most of the graduates and trainees.

Table 2 gives the percentage ratios of the maximum scores 5 compared to the total number of respondents (excluding the answers to Q10).

Table 2. *Percentage ratios*

Question / Result	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
%	84,44	84,59	75,72	83,25	53,78	70,38	39,44	83,22	84,56
5	2702	2707	2423	2664	1721	2252	1262	2663	2706

As it can be seen from the exported data, the most serious areas for improvement can be found with respect to Q7, followed by Q5, Q6, Q3, etc. The visual representation of the overall results is given in Figure 3.

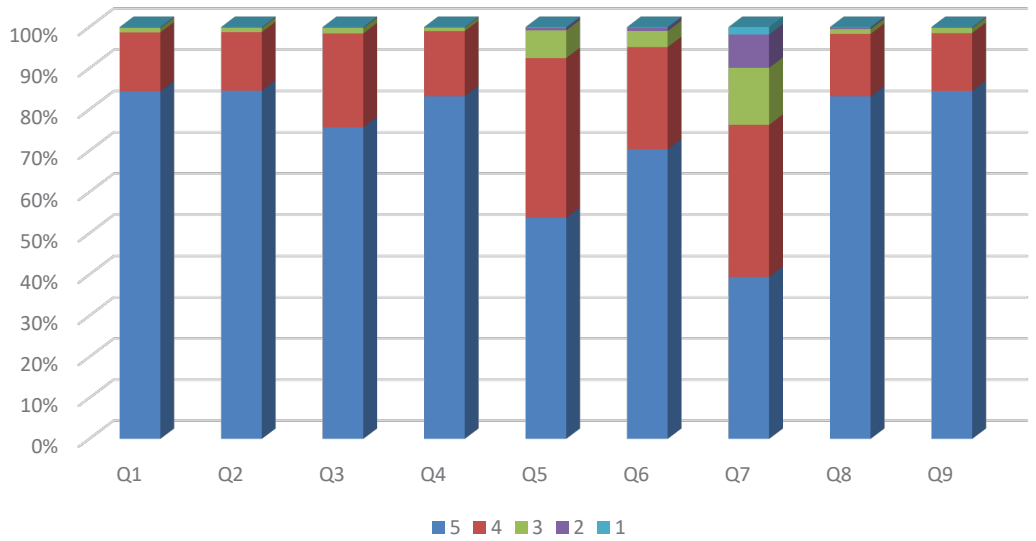

Figure 3. *Data from the empirical study*

The identified areas for improvement of career development are:

- search for opportunities for maximum adaptation between the knowledge gained in the higher education institution and the requirements of the practice, combined with career counseling, regarding the requirements of the labor market;
- carrying out more activities from the career center, including training on acquiring specific competencies such as fast task management, successful sales, teamwork, communications development, and more. They aim to enable students to cope in their future work with several tasks at the same time, without affecting the quality of performance;
- expanding the acquired knowledge of the specialty in the direction of performing the assigned tasks during the practical training;
- developing competencies in the field of the regular timing of tasks, etc.

These areas for improvement are the basis for formulating proposals for changes in channels for informing and accessing students and improving career development processes based on their digitization.

4. Changes in information channels, access to students and the career development cycle

Data from empirical analyses indicate that areas of the career development cycle need to be identified for targeted impact. In this way, it is possible to achieve higher efficiency of the services provided to the career guidance students, regarding the requirements of the labor market. These services are of an administrative nature. For their creation methodological components known in the theory are used (Kirilova, 2016). Accordingly, in 2018, the University of National and World Economy developed and adopted a concept for organizational and functional development of its career center. The concept provides for analysis, development and implementation of a set of policies, activities and initiatives. Their aim is to have a targeted impact on the career development cycle of students,

especially in the initial stages related to university education. These are:

- developing and implementing a comprehensive new communication policy towards learners considering their individual career needs;
- introducing a unified electronic portfolio of activities, digital competences and practical knowledge and experience for students as part of the overall job search system;
- continuous training of students in terms of activities, competencies and practical experience in terms of applying for specific job positions;
- validating digital competences of students in support of their career development;
- the extension of ongoing training, on the peculiarities and characteristics of the lifecycle of career development;
- adopting the individual practical training of students and conducting internships as an essential part of the conditions for finding a suitable future job.

The abovementioned measures and activities are aimed at improving the conditions for the career development of students and increasing the efficiency of the communication between the career center and the students. This, with equal other conditions, is a prerequisite for their successful realization on the labor market, and this is an indicator of higher quality of education.

5. Conceptual model for career development digitalization

The development of a unified conceptual model of an information system is the basis for the integration of existing solutions in the field of career development of students at the University of National and World Economy. Its feature is the inclusion of a variety of data sources, which is a challenge for their processing and the creation of the necessary references, information and knowledge. It is also very important to apply different algorithms to search for information in the web environment as well as to manage the risk of such a project. Some of the latest research in this direction (Milev, 2017) highlights the complexity of designing, developing and implementing the relevant database to support search algorithms. On the other hand, the design of a common conceptual model for the career center activity and its technical realization is associated with considerable financial resources, time and implementation of management approaches. By its nature this is an information project with an appropriate level of risk. In the theoretical studies, some of the leading authors (Stoyanova, Petkova, Todorova, 2018) emphasize that risk management is based on analysis and evaluation using scientific approaches and advanced technologies. By accepting this assumption, it is important to point out that it is possible to expand the model in the future by developing a corresponding software application. In view of the objective of the study, it is proposed that the conceptual model for digitization of career development should include the following components:

- Information system of career center;
- Delivering system of career center;
- Alumni information systems;
- Unified registry of employers of the university;
- Web student system;
- University web site;
- Social media;
- Mobile application for students;
- Other university systems.

The visual representation of the connectivity of the individual components is presented in Figure 4.

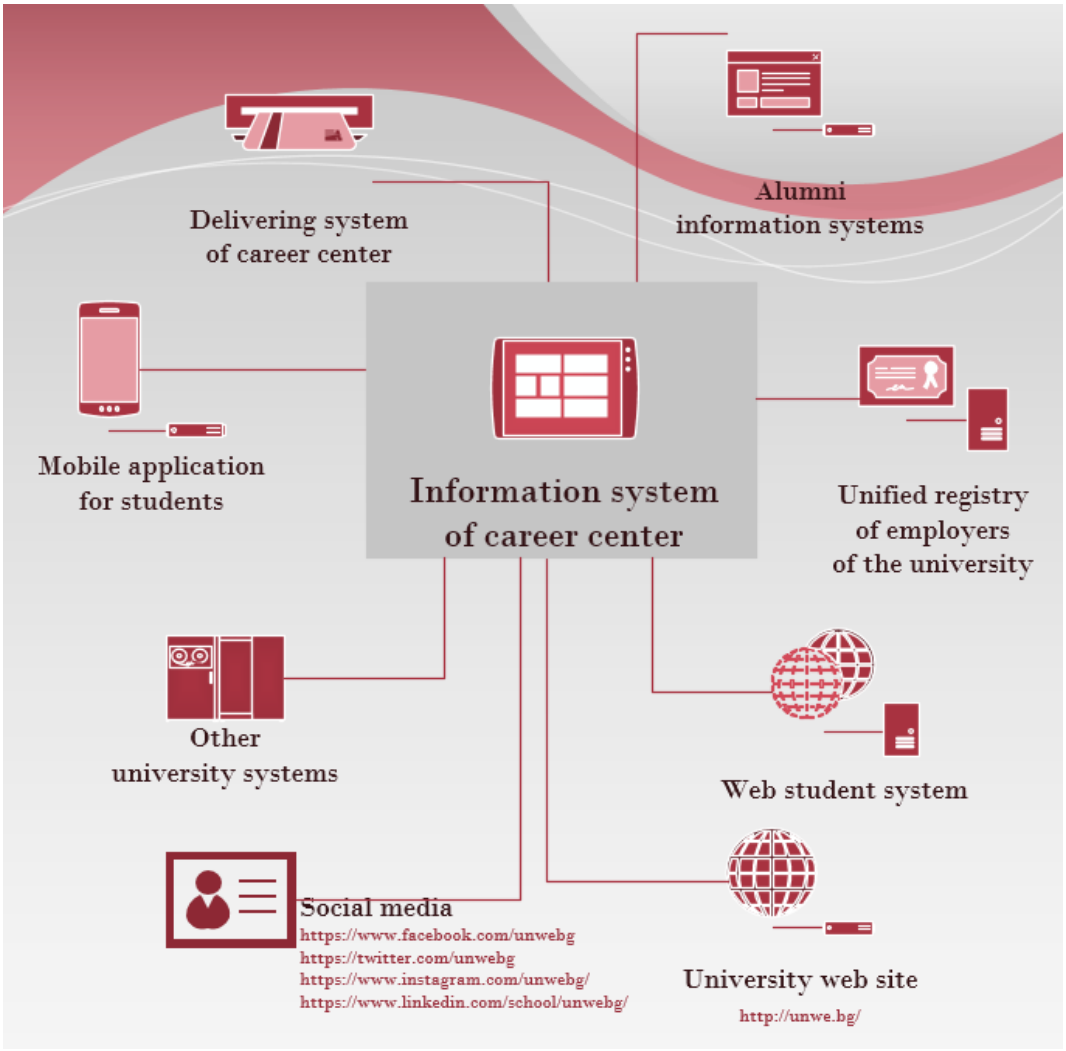

Figure 4. *Conceptual model for career development digitalization*

The information system of career center is the central component of the conceptual model for the digitization of career development. This component has links to all other components of the model. The delivering system of career center is a component in the concept of career development digitization which keeps all data related to the day-to-day career of the career center, including all incoming and outgoing documentation and correspondence. Alumni information systems is a component of the conceptual model for career development digitization which keeps all data related to existing Alumni clubs at the university. The Unified Register of Employees of the University is a component in the conceptual model of career development digitization which stores in a unified way all data about employers with whom the university has a relationship. The web student system is a component of the conceptual model for digitization of career development

which keeps all data on university students. The university web site is a component of the conceptual model for digitization of career development which stores the data related to the functioning of the university web site (www.unwe.bg). Social media is a component of the conceptual model of career development digitization that stores all the data related to the social media presentation of the university, including Facebook (https://www.facebook.com/unwebg), Twitter (https://twitter.com/unwebg), Instagram (https://www.instagram.com/unwebg), and LinkedIn (https://www.linkedin.com/school/unwebg). Mobile application for students is a component of the conceptual model for career development digitization that provides students with mobile access to all career center services. Other university systems are a component in the conceptual model for career development digitization which presents the other available information systems at university level, such as a research project system, a teaching portal, etc.

Conclusion

Based on the analyses and empirical studies carried out, the following conclusions can be drawn:

- there is a clear link between the career development of students and the quality of higher education, which requires the development of procedural and technological solutions to improve the career opportunities of students;
- the activity of career centers and other structures in higher education institutions should be expanded in the search for opportunities for maximum adaptation of the knowledge acquired to the requirements of the labor market;
- it is imperative to improve the career development of students by providing new digital administrative services;
- positive experience can be gained by developing and adapting a single conceptual model of an information system using a variety of data sources.

All the suggestions outlined in the present study are aimed at improving the environment that offers career opportunities for students based on the digitization of the main processes. The results of this study can be used to build a unified information system at a higher education career center. From a scientific point of view, they provide answers to a number of issues related to the implementation of the practical training policy. From a theoretical point of view, the higher quality of higher education is associated with better career development. In this way this study sets the basis for future research. It should identify the specific links and relationships between the parameters of the practical training and the quality characteristics. In this way the link between the quality of higher education and the career development of the students can be better understood.

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