



## Using ICT Solutions for Better Defined and Assesed Qualifications for Higher Education

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### 1. An ever changing world

World and society are facing tremendous changes and shifts happen every day.

We are living in a digital environment. 31 billions of searches on Google are done every month (to whom were these questions asked B.G. – Before Google?). The average number of weekly business emails received is 304. The number of today websites exceeds 200 millions and this is nowadays the most powerful marketing business tools. The amount of new technical information is doubling every two years. We are witnessing technological progress with unprecedented social implications and we are living exponential times.

The workforce is changing also. The top 10 in demand jobs in 2010 didn't exist in 2004 and who may say what will be the top 10 most wanted jobs in 2020? Students are currently prepared with sometimes old and out of use methodologies and technologies for jobs that don't yet exist where they'll use technologies that haven't been invented, especially for the domains like computing, non conventional energies, new materials, bio-combustible.[1] Some experts estimate that a today's learner will have 10 to 14 jobs by the age of 38. "Work" used to be considered a place. Today, project teams are working from anywhere in the world. [2] That means the competition for jobs is no longer limited to where you live. No organization guarantees a lifetime career to the employees, and the outsourcing seems to be the new global model. For the first time in history we have 4 generations working side by side: traditionalist, boomer, gen X and millennial. That workforce is very different in communication style (writing, calling, emailing, texting) or the capability to be innovative and competitive.

Not least, the public of schools and universities changes. Transversal and even some of the professional competences are acquired by multiple training pathways, by "formations universitaires non diplômantes", re-training or bridging courses by lifelong learning. Moreover, the labour market has changed significantly and will keep changing due to technological changes and concern for sustainable development. [3] Such dynamics should be reflected in the university study programmes and the universities should pay more attention to the social and economic relevance of the learning outcomes.

### 2. University – enterprises partnership for education

The Bologna Process and the European Commission developed policies and programmes for the modernization of higher education, lifelong learning, for bringing universities and the social and economic world closer. According to Trend 2010, 60% of universities consider quality assurance and 58% of universities consider internationalization as the most important changes during the last ten years in order to become more competitive and visible [4].

In this changing world, it is clear we are witnessing a circuit of knowledge, skills and competences between universities and the labour market. Along with the economic development based on innovation and use of new technologies, new fields are created, as well as new requirements related to graduates' competences. The work force becomes more competent and it has innovation skills enabling them to contribute to the advancement of knowledge that leads to new fields and occupations, which require higher skills and more complex competences which must be assured by universities and the circuit continues. The consequence is that the number of jobs for higher education graduates and highly skilled employees will increase and in 2020 the projected number of jobs with higher qualification in EU 25 will be more than 50 millions [5].

In the new world of education, an important part of the skills and competences needed at the work place will be accumulated by complementary work-based training or due to professional experience.

In Romania, according to the survey "Recent Higher Education Graduates and their Integration on the Labour Market" [6] undertaken by the National Qualifications Authority - NQA in 2010, 55% of the graduates consider they acquired in a large or a very large extent the abilities needed for them to carry out their job tasks. Half of the graduates consider the practical training carried out in university has been useful in their activity after graduation. Most graduates (86%) consider they have learned how to practice their profession mostly on the job, not in university.

In a society where training becomes essential, training places diversify tremendously, the evolution of competences required by employers is unprecedented and occupations change faster and faster; universities are required to train students for jobs that are not yet defined. Green industries and renewable energies raise countless challenges that universities must meet.

Society changes, the public is digital native, and universities need to react through new curricula for employability, new learning technology and, why not, through a new type of professors, able to shape the spirit of and provide knowledge to a new public. Therefore, universities must keep the mission to provide basic training, transversal



competences, especially ICT, communication, teamwork etc. especially when the architecture of jobs changes very rapidly.

For example, in Romania, the average number of months needed to find the first job, consistent with the education level after graduation is four months. We can see also the average according to different fields in Figure 1.

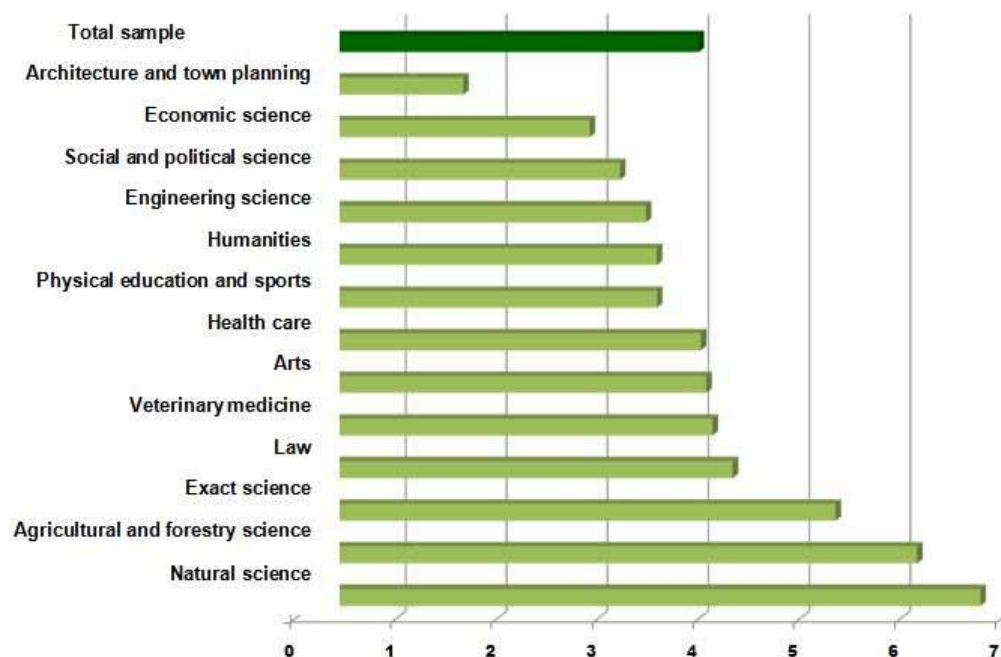


Fig. 1. Average number of months needed to find the first job, in accordance with the education level after graduation, according to the field [6]

In order to achieve continuity in training and recognition of prior learning, universities need instruments that ensure harmonisation, information, correlation and visibility of training provision.

Thus it is very important to know that graduates consider: two thirds of their theoretical knowledge and one third of their practical abilities were acquired in the educational programme they attended and more than half (55%) of the knowledge and abilities they need at work have been acquired right there, approximately one third (32%) have been acquired in university, and 14% in other circumstances. 76% of the employers do not care if a prospective employee has a bachelor degree or a master's degree and both employers and graduates think that the higher education system currently succeeds in providing its graduates with the theoretical knowledge they need, but not with practical abilities.[6]

On the other hand students, young people generally, should have access to information in order to be able to compare, they need instruments that allow them to navigate in a society with unprecedented labour market dynamics, to have a rapid insertion on the labour market.

This is why Romania developed the National Qualifications Register for Higher Education, under a project co-financed by the European Social Fund and the Romanian Government – DOCIS (*Development of an operational system of qualifications in higher education in Romania*). This instrument is being improved under a follow-up project – DECIS (*Building capacity for the implementation of the higher education qualifications system*), where RNCIS will be added new functionalities and options: evaluation of study programmes to increase their relevance for society.

### 3. National Register for Qualifications in Higher Education – RNCIS

#### 3.1 RNCIS goals

RNCIS ([www.rncis.ro](http://www.rncis.ro)) is an integrated web application that centralizes all descriptions of higher education qualifications in a digital structured format, in a national database which can offer a powerful and flexible search engine for qualifications, study programmes and occupations. Furthermore, RNCIS is intended to be a management tool for CNCIS by providing valuable information about all qualifications offered by accredited Romanian universities, both to authorities and to the general public.



It will help the students and employers in making good decisions and it will offer an overview of the provision of the universities, assuring in this way the transparency and the visibility of CNCIS at national and international level.

RNCIS is developed based on the NQFHE Methodology [7] that stipulates the identification of the learning outcomes for each qualification. Thus, any learning outcome has its own autonomy, indicating different targets of training, specialized professional training processes and specific assessment processes. There are interdependent relations between these three types of learning outcomes, as well as a hierarchy in the process of achieving these results as follows: certain types of knowledge build abilities, and a specific combination of knowledge and abilities develops a competence.

### 3.2 To whom RNCIS is addressed

The students and/or prospective students represent the largest category of RNCIS beneficiaries. For them, RNCIS represents a comprehensible, transparent and accessible instrument which expresses very clearly the opportunities of having their learning outcomes recognized, so they can take appropriate and informed decisions regarding the content of the study programmes they want to follow and the credits they need in order to graduate and to obtain a specific qualification. [8]

For the **Universities**, RNCIS is offering new opportunities for the development, implementation and management of the educational process. This is very useful if we consider that the universities as “keepers of the key for society and the economy based on knowledge development”, are in an open competition for “clients” for their study programmes. This is highlighted by statistics that reveal that the rate of university registration continuously increased in the last decade. This situation is explained by the development of private universities and of universities’ networks, by establishing new universities or new branches of universities in non-traditional locations, under the influence of demands from a changing labour market.

**Members of sector committees and social partner’s personnel** represent another category of beneficiaries of the RNCIS software application. This is relevant because the qualifications system cannot exist and have an impact outside an economic and social environment that actively interacts with the academic environment. The first need of the employers is to have the right people for the right job. A better suitability of qualifications and competences with the needs of the labour market, as well as the capacity of fast adaptation of the universities to the changing needs of the labour market, is what both universities and employers need. In this way, through RNCIS, the employers will be able to check if their expectations regarding the knowledge and competences of a graduate, future employee are fulfilled.

**Career consultants or parents** can use RNCIS, too. They can use the software application to see the real provision of the universities or they can consult the register to be in the position to give the best advice on the study programme one should follow in order to be able to get certain jobs after graduation.

### 3.3 RNCIS functionalities

The main functionalities of the RNCIS system can be grouped as follows:

**a. Search for qualifications:** The qualification searching engine allows for finding details about a certain qualification, based on various filtering criteria.

**b. Description of qualifications:** Accessing the summary of a qualification, a user can easily obtain valuable information such as study duration, graduation title, number of necessary credits for graduation, professional and transversal competences, faculties which offer this qualification, possible occupations for the diploma holder, etc.

**c. Presentation of universities offer:** Together with displaying search results, the system presents next to the respective study programme the list of faculties offering the qualification in order to facilitate users' access to universities.

**d. Qualifications management:** The qualifications management component is a key element of RNCIS. By accessing it, users having faculty, university or NQA roles can define the qualifications by describing their characteristics (special attributes), competences, descriptors of learning outcomes and specific study offer.

**e. Reporting:** Based on multiple criteria, RNCIS gives the possibility of generating complex reports, such as: faculties which offer a certain qualification for a certain level, in general, or in a city, or in a certain region, qualification needed for a certain occupation; universities / faculties where one can acquire specific knowledge, skills or competences; classification of occupations using various criteria: qualification, fundamental domain, study domain, study programme etc.

**f. Administrating the application:** The administrating component of the system will be structured on different levels, corresponding to the specific administrating functionalities.

**g. The access component.** The access component of the application controls the user access, in terms of authentication, authorization, access control and data control. [8]

#### 4. IT solutions for managing the RNCIS

The National Qualifications Authority intends to continue the development of RNCIS in order to increase capacity of managing the National Qualifications Framework for Higher Education (NQFHE). A new component will be added to the system, allowing it to provide support in the training programme for the staff involved in the evaluation of qualifications in higher education. The system will contain an e-learning platform which should provide support for learning, testing and assessment, content administration, management and monitoring of educational process. The platform should allow for synchronous learning – the trainer fully controls the educational process, and asynchronous learning – own pace study. The platform should provide for management facilities and for the presentation of various types of educational content such as interactive materials as multimedia, interactive guides, exercises, simulations and tests. The platform should allow trainee access without having installed dedicated software.

#### Functional Architecture

The functional architecture is represented in the Figure 2:

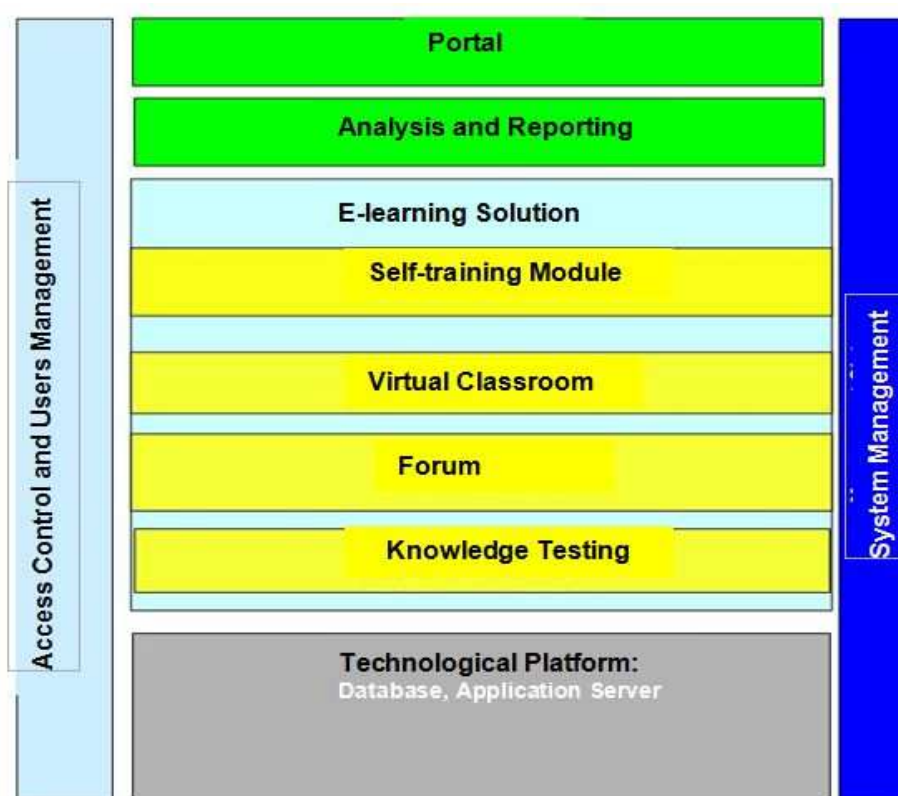


Fig. 2 Self-training Module / own pace training

The platform should allow for testing the trainee during the course so that the materials he/she receives for study should be adequate to the level of knowledge acquired by the trainee until the respective stage. The platform shall allow the trainer/course developer to condition following certain stages of the course on the successful completion of other chapters. [9]

The user may visualize the scenarios for creating and going through the qualification validation dossiers, as well as for the use of NHRHE. The platform shall include the versions of the specific scenarios, according to the types of users accepted by the system.

**The virtual classroom** shall allow delivery of content to users synchronously, with learning assisted by a trainer. The trainer may communicate with trainees by audio, video and chat options. The trainer and the trainees may communicate through the chat option. The trainer has the possibility to manage instantaneous tests solved by the trainees and to see the results immediately. The trainer may adjust the training plan during the course, without having to leave it.





The system includes a **forum** facility, where trainees may clarify certain aspects, study more in-depth certain topics, ask for support in solving exercises or problems or may work together to solve team tasks. The trainer has the possibility to moderate discussions and provide assistance in this virtual environment.

The user shall be able to download and use off-line a **tutorial** with the content and several typical problems for each module. The tutorial shall have two parts: the first part focuses on RNCIS (concept, methodology), and the second focuses on operating with RNCIS, as representative of the university or of the faculty.

The eLearning platform shall allow for setting roles for users, choosing any combination (e.g.: student, trainer, manager, and administrator). The functionalities to which users have access are restricted by their roles. The platform shall allow for defining groups and allocating users to groups. These groups are used whenever it is necessary to select users for enrollment to courses or any other type of activities.

## 5. Conclusions

The 21<sup>st</sup> century will be and “Enlightenment century”. The whole world and society will be transforming in ways nobody can predict now. We need to live differently and to see our world and ourselves from a new perspective: COMMUNICATION and COMPETITION are the most fashionable words. To survive we will need to adapt, to think and re-think the workforce and most of all the *education system*. The system in force must adapt because it is a system built for the Industrial revolution two centuries ago.

RNCIS is one of the answers of NQA from Romania proposed in order to contribute to the “digital revolution” and to improve and modernise the higher education. RNCIS allows “digital natives” students to become more and more involved in building their own knowledge, skills and competences. On the other hand RNCIS creates opportunities for the recognition of informal education to become more accessible than ever before.

The education institutions and especially the *universities* have no more physical time to teach content and skills, meaning knowledge and competences. They have to figure out a way to use content to teach skills, to train competences by using all the knowledge, all the existing information and new technologies. It is not an easy job, but it we need to build together a new education system. Otherwise, the “ivory tower” will become “no man’s land” and the business community will still ask for “tailor made” graduates, without having time and money to wait for the academic world to adapt itself and to move on in an ever changing world.

Meantime, universities should remain a place for research and innovation, in order to contribute to 21<sup>st</sup> European society with both valuables graduates and new ideas for a “smart, sustainable and inclusive growth”. [10]

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