

EDUCATIONAL RESOURCE MANAGEMENT BY USING VIRTUAL PLATFORM

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Abstract: Every company from all over the world deals with different types of resources: material resources, financial resources, human resources and of course informational resources and strives to find the most efficient ways to use them. While the output of companies is represented by products and services, the output of universities is represented by knowledge gathered by students. While the companies' output depends on the material resource quality, the universities' output is strongly influenced by the quality of educational resources and also by how they are transmitted from teachers to students. Following this line, the present paper approaches a tool used by universities in order to have an efficient educational resources management. The paper focuses mainly on the impact of e-Learning platform on teaching staff, based on a marketing research conducted in several Romanian universities. Data collection was achieved by a structured questionnaire disseminated via Google docs; IBM SPSS software was used for data processing and analysis.

Keywords: Virtual platform, e-learning, teaching staff, university.

1 INTRODUCTION

Over the last decade scientific and technological progress boosted the development of information and communication technology and allowed a spectacular evolution of educational resource management; novel dissemination methods of educational resources were made available to teachers and students, along with new ways of communication and

learning via virtual platforms. Alas, technological progress and deploying new IT encounters user reticence worldwide.

The use of virtual platforms is mainly associated with distance learning. Distance education was launched in Europe by the University of London in 1858, in an attempt to offer the educational market a new concept, which, while accessible to a significantly wider target group maintained curriculum and the

quality of graduates identical to that of face-to-face education.

Although the system originates in Europe, its spectacular development took place in the United States of America, most probably due to the „youth” of the US educational system, the large distances to be overcome and, to a certain degree, to the lack of rigidity and attachment to

a classical education system (Holden & Westfal, 2010). Hence a literature search in this direction reveals differences of concept and approach between the classic European school and the more modern and open one of the United States.

According to the distance learning portal the educational offer is rather wide, as presented in Figure 1.

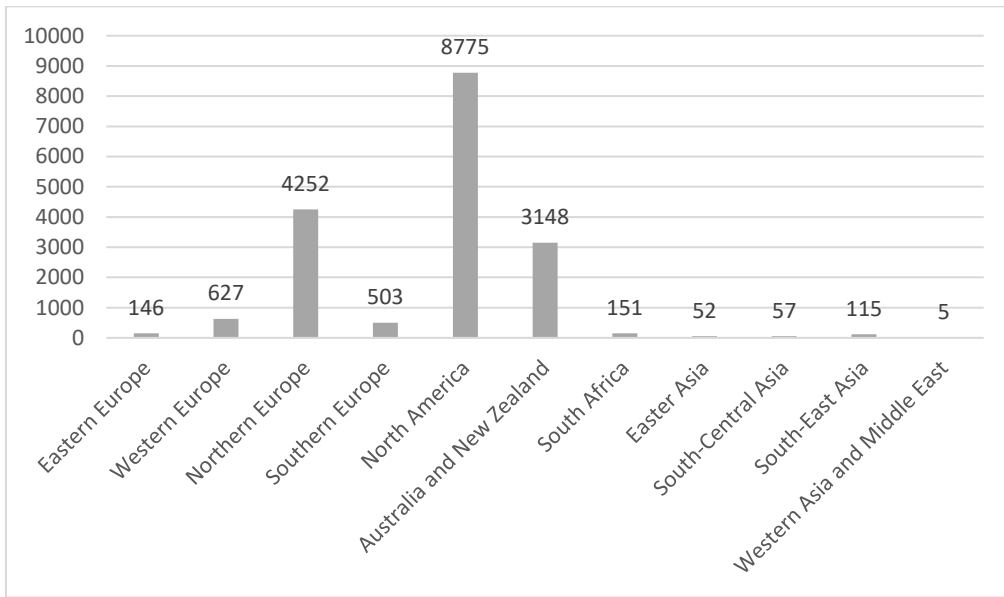


Figure 1. Distance learning around the world

As can be seen in Figure 1, North-America and northern Europe, particularly the UK dominate as to the number of study programs. Also significant is the consistent educational offer of Australia and New Zealand.

Although certain data made available by this portal are debatable (e.g. data referring to Romania are by no means relevant), it is quite revealing as to the current international trend, based mostly on the updated information on countries with tradition in distance education. Of the offered bachelor, master, PhD degrees as well as short courses, master studies are dominant, as Figure 2 shows.

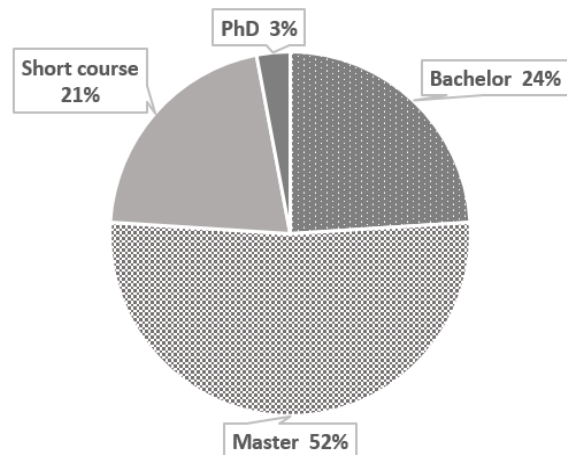


Figure 2. Distance learning offer from degree's viewpoint

From the viewpoint of the fields covered by the offered programs, most are in Business & Economics, as presented in Figure 3.

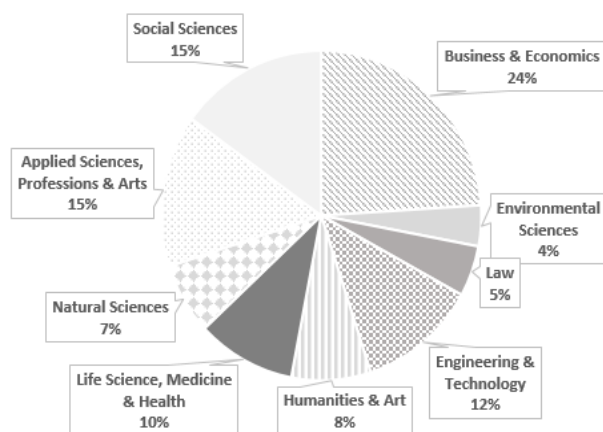


Figure 3. Distance learning offer from fields' viewpoint

From the viewpoint of e-learning platforms, in literature (Sakarka, Deshpande & Thakare, 2012) four models more frequently deployed by such IT systems are identified: IEEE Learning Technology Systems Architecture (LTSC), Sharable Content Object Reference Model (SCORM), Blackboard and Moodle. Under consideration of the provider companies of such systems (McIntosh, 2015), of the trends and forecasts for the e-learning marketplace (Docebo, 2014), Moodle emerges as accounting for 30%.

An analysis of the above data yields the conclusion that internationally, the virtual platforms might be considered efficient tools in educational resources management.

2 FRAME OF USING VIRTUAL PLATFORMS IN ROMANIA

Within this international context, Romania's educational offer of distance learning is rather varied and numerous. The first distance learning study program was set up at the Academy of

Economic Sciences of Bucharest in 1998. Evidently their field was Business & Economics, and as mentioned above, still quite appealing in 2015.

The new education system was well received by the potential students. In the beginning the student population consisted of more mature individuals of over 30 years of age, who, mostly for financial reasons, had not pursued higher education upon finishing secondary school. Typically this category of students was employed and seeking betterment in terms of salary raises and/or promotion to positions reserved for graduates. In 2015 Romania the average age of distance learning students has decreased due to numerous fresh high school graduates enrolling directly to such programs. Their motive is also of financial nature, as within the Romanian economic context high school graduates often need to seek employment, thus forfeiting the time for full-time higher education. Hence the demand for distance learning study programs has steadily increased to a considerable level.

The evolution of distance learning in Romania while significant as to the number of established study programs has been rather timid as to the organization of the educational process. Further on the paper reviews the current state of Romanian distance learning from the viewpoints of the educational offer, the legislative framework and the applicable standards.

The educational offer of bachelor study programs in Romania comes from 55 state and 41 private universities. It needs be pointed out that unlike many western countries, in Romania it is the state universities that benefit from tradition and good national and international rating. From among these universities 33 state and 17 private ones offer distance or part-time learning programs.

Under the aspect of the covered fields of study the educational offer is vast. In order to establish an analogy to the international trend,

the authors have grouped the study programs into the categories existing also on the distance

learning portal. Thus figure 4 presents the educational offer in Romania by fields.

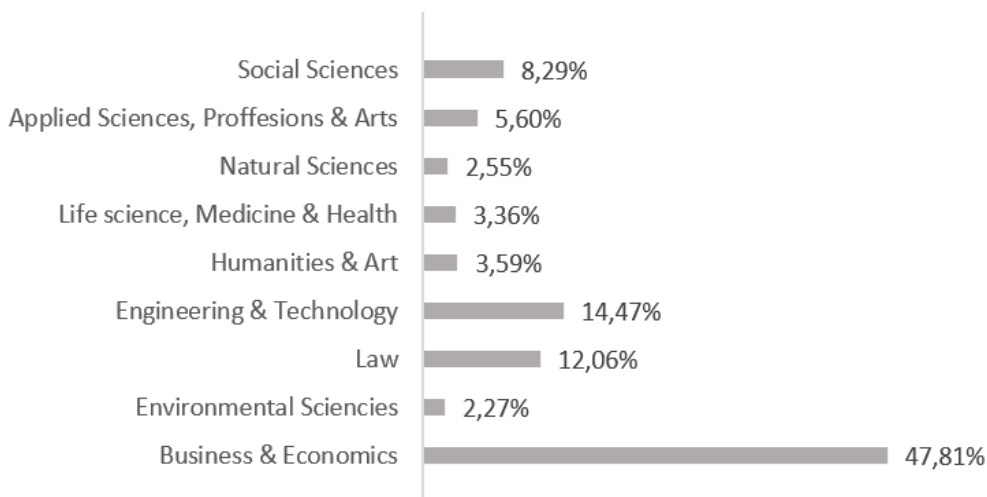


Figure 4. Educational offer in Romania by fields

An analysis of the educational offer shows that Romania fits the international trend, as the vast majority of students are enrolled in Business & Economics, followed by Engineering & Technology.

In Romania the quality standards are provided and subsequently accredited by the Romanian Agency for Quality Assurance (ARACIS), according to which the organization of distance learning for authorizing or accrediting a distance-learning study program have required the existence of an e-learning platform since 2011, what evidently triggered the implementation of such platforms in Romania. Although only few studies have been completed on the development of distance-learning and the use of electronic platforms in Romania many sources include e-learning indicators, like: the level of computerization of a given country, the ICT Development Index, the number of internet users per 100 inhabitants, the number of computers in schools and universities, the

number of education provider institutions connected to the internet etc. In Romania several companies are engaged in e-platform development (Lupu Dima, Edelhauser, & Ionica, 2010) The most frequently used platforms are AeL – Advanced e-Learning (developed by Siveco Romania S.A.), ASK e-Learning (developed by InsideMedia), and e-Learn (developed by Timsoft Timisoara). In addition, certain Romanian universities, like University of Bucharest and Babes-Bolyai University of Cluj-Napoca have developed their own platforms. Regardless of the type of platform, all facilitate bidirectional communication, secure access based on usernames and passwords, the implementation of e-learning course modules as well as a large number of online users. Prices and maintenance costs evidently vary by developer. This is the reason underlying the acceptance of the Moodle offer (Figure 5) by the vast majority of user universities.

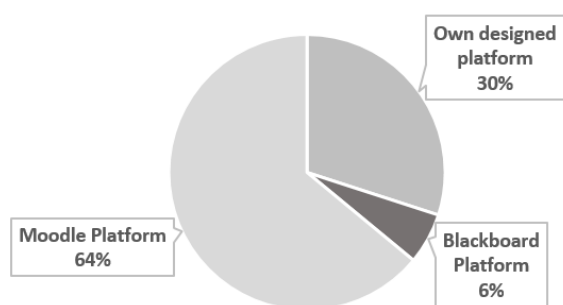


Figure 5. E-learning platforms used in Romanian universities

The paper focuses on highlighting the effects of using virtual platforms upon teaching staff members, as well as on formulating and discussing possible solutions and evolutions of making the use of virtual platforms an efficient tool for educational resources management.

3 MARKETING RESEARCH ON THE IMPACT OF USING VIRTUAL PLATFORMS BY TEACHING STAFF MEMBERS

The main aim of this marketing research is highlighting the impact on the academic teaching staff in Romania of the new standards in distance learning requiring the implementation and deployment of the e-learning platform, in view of identifying modalities of further development of distance learning and its alignment with the national and international quality standards, evidently by means of ICT solutions and tools.

3.1 Method and instruments of the marketing research

The market study presented in this paper was conducted by survey, a method considered by many theoreticians and practitioners as one of the most efficient available, allowing the collection of a large quantity of information in a

short period of time and at relatively reduced costs (Lefter, 2004). The method is based on a questionnaire as the tool for data collection and a sample representative for the population as a whole. The structured questionnaire used in the study consisted of a set of questions arranged by a fixed interview scheme, and answered by all respondents included in the sample (Brace, 2013). Of the 17 questions 16 are close-ended and one is open-ended. The close-ended questions included a binary answer based one, a multiple-choice based one, three questions offered a simple choice scale and the rest of 11 questions were based on the ordinal scaled. Data processing and analysis was conducted by means of SPSS v.20 software.

The size of the representative sample was determined in accordance with the literature (Lefter, 2004), being of 369 respondents.

The main problem faced by the authors of this paper was the difficulties encountered in obtaining responses from the subjects of the representative sample and the relatively long period of time over which these responses were collected, considering the modality of questionnaire dissemination, namely by e-mail and the use of GoogleDocs tools.

3.2 Marketing research objectives

The main objectives of the marketing research are presented below.

- Identifying the percentage of teaching staff involved in activities with distance learning student, conducted via the e-learning platform.
- Identifying the percentage of teaching staff members, by age and academic rank category, respectively, the users of the e-learning platform.
- Identifying how teaching staff members use the e-learning platform, as to the ease of navigation, course module configuration, updating, access to information and bidirectional teacher-student communication.

- Identifying the applications available on the e-learning platform predominantly used by the teaching staff, as well as identifying the utilisation of these applications by age and academic rank category, respectively.
- Identifying the advantages recognised by the teaching staff of the e-platform in teacher-student activities.
- Identifying the time dedicated monthly by the members of teaching staff to work on the e-learning platform.

3.3 Results of the marketing research

The completed marketing research revealed the impact of the e-learning platform, the possible causes for the diminishment of the educational offer, as well as possible solutions.

As mentioned, SPSS software was used for data processing and analysis. This included two levels: preliminary analysis of the data, that is the statistics of each question by scale type, and the more in-depth analysis of the link between variables (Janssens, 2008, Malhotra, 2013, Sweet & Martin, 2014). Processing and analysis of the marketing data obtained by the structured questionnaire involved three stages: defining the variables of the survey, recording the responses from the representative sample into the SPSS data basis, and the actual analysis of these data. The essential results of the study are presented further on.

Figure 6 shows the percentage of teaching staff using the e-learning platform, according to which 88.33% of teachers involved in distance learning in Romania used the applications of the virtual platform. While this percentage obtained by a binary answer question is in the opinion of the authors quite high, it does not reflect a conviction of the platform users as to its efficiency and importance, using the platform being rather an obligation of the teaching staff involved in distance learning.

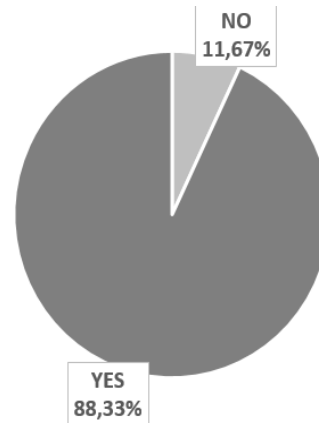


Figure 6. Percentage of teaching staff using the e-learning platform

More relevant, in the authors' opinion is how the variable age and academic rank, respectively influence the utilization of the e-platform. These influences are shown in Tables 1 and 2.

Table 1. Influence of age upon the use of e-Learning Platform.

		Age			
		25-30 years	31-45 years	46-60 years	over 60 years
Do you use the e-Learning Platform for the Distance Education activities?	No	53.85%	9.47%	14.63%	0.00%
	Yes	46.15%	90.53%	85.37%	100.00%
Total		100.00%	100.00%	100.00%	100.00%

Table 2. Influence of didactic degree upon the use of e-Learning Platform.

		Didactic degree			
		Assistant Professor	Lecturer	Associate professor	Professor
Do you use the e-Learning Platform for the Distance Education activities?	No	24.00%	15.34%	14.77%	0.00%
	Yes	76.00%	84.66%	85.23%	100.00%
Total		100.00%	100.00%	100.00%	100.00%

Surprisingly, a quite high percentage (53.85%) of the young teaching staff (aged 25 – 30), that is 24% of the teaching assistants do not use the e-learning platform in their work with distance learning students. A possible explanation would be the well-known fact that the teaching norms of younger teaching staff, evidently holding a lower academic rank, include more hours than that of teaching staff more senior as to age and academic rank. Another aspect to be considered and that could also generate a certain degree of reticence of young and/or low academic rank teaching staff, namely

assistant teachers, in using the virtual platform is the fact they being mostly tutors have more tasks to fulfil than coordinators. A contingency coefficient was used in order to highlight the influence of the variables age and academic rank, respectively, on e-learning platform utilization, such as to reveal the intensity of the link between these two nominal variables (Constantin, 2006, Janssens, 2008, Darren & Mallery, 2020). The two contingency coefficients were obtained by means of SPSS software, as shown in tables 3 and 4.

Table 3. Connection between the use of e-learning platform and age.

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.253	0.250
N of Valid Cases		60	

Table 4. Connection between the use of e-learning platform and didactic degree.

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.222	0.382
N of Valid Cases		59	

As follows from the tables, the values of the contingency coefficients are 0.253 for the influence of age on platform utilization, and 0.222 for the influence of academic rank on platform utilization, respectively. According to literature [13], the contingency coefficient ranges from 0 to C_{max} , where C_{max} is computed by equation 1:

$$C_{max} = \left(\frac{k-1}{k}\right)^{1/2} = 0,866 \quad (1)$$

where k is the number of levels of the independent variable; in this study the independent variables are age and academic rank, respectively, each with 4 levels. As the value of the contingency coefficient tends

towards 0, the link between the two variables is weaker, while a value of the contingency coefficient close to Cmax indicates a strong link. The value of the contingency coefficient in the present case falling into the first half of interval (0; Cmax), is indicative of the fact that statistically the variable age and academic rank do not

influence virtual platform utilization in distance learning activities.

Table 5 shows by means of an ordinal semantic scale the utilization of the e-learning platform under consideration of several characteristics. The scale ranges from 1- very difficult to 5 - very easy.

Table 5. Appraising the e-Learning Platform Characteristics.

	N	Minimum	Maximum	Mean
Browsing	326	2	5	4.13
Course settings	326	2	5	4.09
Data update	326	1	5	4.13
Information access	326	1	5	4.36
Bidirectional communication	326	1	5	4.06

A positive note derives from the fact that the respondents of the representative sample assigned scores over 4 points to all five attributes of the virtual platform. Of these, the highest score was assigned to platform user access to information, while the lowest score denotes bidirectional coordinator/tutor - student communication. The high scores indicate, however, that the importance, efficiency and utility of the e-learning platform are understood and accepted by most

teaching staff involved in distance learning in Romania.

The applications available on the e-learning platform and used by teaching staff need also be identified in order to highlight the current tendency of sustained development of Romanian distance learning, evidently based on virtual tools. Table 6 features such applications as resulting from the answers to a close-ended nominal multiple-choice question provided by the respondents.

Table 6. Percentage of using the e-Learning Platform Applications.

	Responses		Percentage of Cases
	N	Percentage	
Profile configuration	24	9.1%	45.3%
Educational resources distribution	44	16.6%	83.0%
Assignments	42	15.8%	79.2%
Communication	35	13.2%	66.0%
Forum	29	10.9%	54.7%
Activity planning	32	12.1%	60.4%
Student activity report	26	9.8%	49.1%
Tests	33	12.5%	62.3%
TOTAL	265	100.00%	500%

As can be noticed the most used application is the dissemination of the educational resources, followed by the application for the completion of student homework or assignments. The least used application of the virtual platform is the configuration of the teacher profiles. Although 83% of the teaching staff involved in distance learning use this facility, the percentage does not necessarily stand for a positive aspect, since it follows that not all modules included by the distance learning curricula are presented in adequate distance-learning technology, as each Romanian university has its own template for the course modules.

In cases of a simple dissemination of the study materials, during-the-term evaluation (defined by self-evaluation and evaluation tests and homework/assignments) as well as final

evaluation are performed completely outside the e-learning platform, such activity not qualifying for e-learning education. Here from situations emerge when homework/ assignments are completed in traditional manner and e-mailed to the tutor. Even if efficient communication tools are available on the e-learning platform, such applications are used only by 66% of the teaching staff, and the forum even less, only by 54.7% of the teaching staff. This aspect indicates that in many situation coordinator/tutor – student communication is conducted traditionally, during face-to-face meetings, by e-mail or over the telephone.

Further relevant was revealing the link between the variables age and academic rank, respectively and the applications available on the virtual platform and used by teaching staff. Tables 7 and 8 show such links.

Table 7. Influence of age upon applications used.

	Age			
	25-30 years	31-45 years	46-60 years	over 60 years
Profile configuration	0.0%	50.0%	47.1%	28.6%
Educational resources distribution	100.0%	78.6%	94.1%	71.4%
Assignments	0.0%	82.1%	82.4%	71.4%
Communication	0.0%	67.9%	70.6%	57.1%
Forum	0.0%	57.1%	52.9%	57.1%
Activity planning	0.0%	46.4%	76.5%	85.7%
Student activity report	0.0%	42.9%	70.6%	28.6%
Tests	0.0%	60.7%	70.6%	57.1%

Table 8. Influence of didactic degree upon applications used.

	Didactic degree			
	Professor assistant	Lecturer	Associate professor	Professor
Profile configuration	20.0%	42.3%	50.0%	26.7%
Educational resources distribution	60.0%	61.5%	78.6%	86.7%
Assignments	40.0%	65.4%	85.7%	66.7%
Communication	0.0%	65.4%	57.1%	60.0%
Forum	0.0%	53.8%	57.1%	40.0%
Activity planning	0.0%	46.2%	50.0%	80.0%
Student activity report	20.0%	34.6%	57.1%	46.7%
Tests	40.0%	42.3%	71.4%	60.0%

The results included in these tables indicate that the application for the dissemination of education materials is used mainly by teaching staff aged 25 to 30 and by full professors, and that the homework/assignment solving application is used mostly by teaching staff aged 31 to 45 and by associate professors.

E-learning platform utilization in distance learning should not be imposed by standards,

but be a consequence of recognizing the main benefits offered by this virtual means. Thus the degree to that such benefits are known was tested by means of an ordinal semantic scale of agree-disagree type; the extremes are 1 – total disagreement and 5 – total agreement; the scores corresponding to the benefits were computed by means of SPSS software (table 9).

Table 9. Advantages gained by using e-Learning Platform.

	N	Minimum	Maximum	Mean	Std. Deviation
Time saving	326	1	5	4.19	1.030
Communication improvement	326	2	5	4.21	0.968
Control increase	326	1	5	3.76	1.050
Equidistant assessing	326	1	5	3.91	1.005
Formative assessing	326	1	5	4.31	0.961
Data security	326	1	5	4.12	1.013
Valid N (listwise)	326				

The main benefit identified by the respondents, with the highest computed score of 4.31 was that the platform allows a continued evaluation of the students. Two other benefits of platform utilization identified by the teaching staff involved in distance learning concern improved communication (score 4.21) and time saving (score 4.19). A somewhat more sensitive benefit noted by the teaching staff members relates to the control over the student, with a computed score of 3.76.

4 CONCLUSIONS

In order to improve these identified and above discussed aspects, the paper proposes a number of concrete solutions available to the coordinators of distance learning study programs. Thus:

- Each member of teaching staff should be made available a printed and/or

audio-video material on the utilisation of the virtual platform and its facilities.

- Including all members of teaching staff involved in distance learning into an active training system for working with the e-learning platform; such system should be organised by the study programme coordinators together with the members of the IT department responsible for the maintenance of the platform in each university.
- The devising of a simple, clear and user-friendly template for the e-learning course module that can be easily implemented by each module coordinator in minimum time.
- An improved financial motivation of the teaching staff involved in distance learning, what can be achieved by several measures. Firstly the hourly pay for teaching staff activity should

increase, as well as paid additional activity conducted on the virtual platforms like: examinations of students, tutoring of diploma projects, devising teaching materials in compliance with the given template, etc. Another possibility would be the involvement of a larger number of teaching staff in distance learning, or including distance education services into the teaching norms, evidently accompanied by an adequate salary increase (in Romania, unlike in the USA for example, a member of teaching staff cannot be employed with a teaching norm made up exclusively of distance learning activities).

- Setting up of an alumni section on the e-learning platform, such as to facilitate a permanent link between the university and the graduates of distance learning. This would provide feedback on the graduates' professional evolution, which in turn would allow the improvement of distance learning.
- Setting up a platform supported link between the university, via its Liaison Office with the Economic Environment and the companies employing the distance learning students and/or graduates, in view of adapting course modules and syllabi to the actual requirements and trends on the Romanian labour market.
- Participation of the teaching staff involved in distance learning in Erasmus programmes for distance learning, such as to allow exchanges of experience with teaching staff from universities in Europe and beyond. Learning from the wide experience of those universities would serve the purpose of implementing international standards

on distance learning in Romanian universities.

The novelty of this paper consists of giving certain directions for further use of the virtual platforms by higher education institutions from Romania, in order to improve the didactic activity. As it resulted from the study, the use of the e-Learning platform has a great impact on the professional activity of teaching staff. The research of the authors of this paper will continue by future studies that reveal the impact of the use of virtual platforms by students, as well. The aim is to find the best solution that help both students and teachers to communicate and cooperate in order to develop an efficient e-Learning process.

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