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A Study About the Digital Readiness of Actors During E-Learning System Implementation

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Abstract: During Covid-19 pandemic many fields of economy suffer, including the education system. As a response to this challenge, education institutions started to implement an online learning solution as a forced kind of innovation, to reduce human interactions. As already exist a variety of E-learning solutions, even if these solutions are paid, free of charge or own developed by institutions, the main tasks [Topic] plays a crucial role in ... remain to implement one of these solutions which needs human resources with necessary digital competences.
Our study aims at measuring the effort and digital readiness of users involved in digital transformation of the learning environment. A survey was conducted during the second quarter of 2020 and 1490 responses were validated collected from students and faculty. Several major aims were followed: the previous experiences in E-learning; the level of digital competences; the content management for the learning purposes; the quality of the interaction between trainer and trainees; the effort perceived during the transition. For the majority of users, it was the first contact with an online learning management system [LMS], but this led to a leap ahead in personal digital competences. The top-rated features appreciated by students were the quality of resources charged and the online live interaction, while both faculty and students emphasized that the effort needed for complying with the requirements of the LMS was greater.

Keywords: *digital transformation, learning management system, digital competences, innovation in education.*

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1. Introduction

As many universities moved their teaching activities to online environments during Covid-19 lockdown, E-learning systems implementation topics become very popular in businesses and researchers` ecosystem. This study is an introduction part of complex research process initiated by research team in springtime of 2020 and represent authors' recent experience of E-learning system implementation in "George Emil Palade" University of Medicine, Pharmacy, Science and Technology, Targu-Mures, Romania.

The successful implementation of E-learning systems in Romania was challenged by the pressure of time, limitations from organizational processes and learning methodologies to adapt them to online environments and of course, human emotional pressure caused by the Covid-19 pandemic. The key components in solving these challenges are: the digital competences of all actors involved in processes, knowledge sharing procedures and stimulations to improve digital skills by learning from each other, necessary ICT infrastructure and, an agile project management approach for matching this components.

In this context, the effort needed to implement and adapt an E-learning solution to an own organizational environment is substantial, even if this implies financial effort, technological or human resources/skills effort.

2. Problem Statement

Nowadays, despite the fact that it is a new topic, researchers can find a plenty of papers and books regarding the digital readiness topics applied to business environment and ICT solution implementation processes. But, regarding digital readiness of teachers and students involved in E-learning we can find quite a smaller number of research articles. We assume that 2020 pandemic crisis will also boost this topic of research.

Recent studies show us that in case of E-learning systems implementation, even students, who are more prepared to use digital tools available are not enough prepared to change their classic courses to online courses [6]. As other authors suggest us that the reticence of students is influenced by their emotional intelligence [1]. Moreover, as authors also mentioned in their research, digital readiness is influenced by more other factors as: field of study, level of education and ICT infrastructure accessibility of actors. Besides all this aspects, living in a digital environment does not reliably imply being digitally competent because, as we mentioned

before, even if young students are familiar with ICT tolls it doesn`t imply that they are able to use ICTs in a competent way [4].

In this context, an innovative use of technology implemented is very important for universities, rather than implementation itself [2]. For adequate using of the E-learning technologies in universities is crucial to train and upskill the students and instructors to obtain learning and teaching skills respectively [5]. Also, trust of users in the system implemented and usefulness of this solution playing an important role in their adaptability and upskilling [3]. Coming back to proposal of our study, we see now how important the digital readiness of users in E-learning system implementation is. First, it helps us to know if users can change their behaviour to adapt to new environments and second, how should we act to help them in upskilling digital competences.

The outcome of this research paper will bring more clarity to the topic of digital readiness of academia members and, in combination with topics regarding businesses` digital transformation will enrich the pallet of case studies for future research. One of the differences between this research paper and other studies already exist is that our subjects of research was constraints by lack of time and emotional pressure caused by Covid-19 pandemic. This use case defers from classic ICT solution implementation when process was led by well analysed needs, not just facing a pandemic crisis which created other circumstances and requirements.

3. Research Questions/Aims of the research

Our research paper aims at measuring the effort and digital readiness of users involved in digital transformation of the learning environment. As this study is an introduction part of a E-learning solution implementation process, the research team involved in the project intends to deliver a set of key findings regarding the importance of digital competences needed and aspects of the behaviour of actors involved during implementation process.

The key questions raised during this study was as follows:

- What is the level of actors` digital competences?
- What is the importance of content management through E-learning platform and quality of resources uploaded?
- What role is playing the interaction between trainer and trainees?
- What is the effort perceived during the transition process from teachers` and students` perspective?
- What are the recommendations for successful implementation of E-learning system from human competences perspective?

Research team assume that during research process could appear other important questions, but these will be detailed at findings paragraph of this research paper.

4. Research Methods

This research paper represents a descriptive analysis of the data collected by a survey and answer the key questions of this paper.

Subjects

The subjects of this research were teachers and students from "George Emil Palade" University of Medicine, Pharmacy, Science and Technology, Targu-Mures, Romania. The target group included 10000 students and 700 teachers from different faculties of university.

Data collection and analysis

An online survey was conducted during the second quarter of 2020 (during Covid-19 lockdown period). The survey was applied through LMS system implemented and social media channels. Totally, 1489 responses were validated composed from 1267 students and 222 teachers. The survey contains more questions then will be analysed in this study. Data was analysed by using Microsoft Power Business Intelligence application.

5. Findings

As we mentioned above, at this stage of research we will provide a summary of data collected but necessary to answer the key questions of the research paper. Through analysis process will be applied a comparative approach of two main categories of respondents, teachers and students. For better understanding of the clusters involved we will start with general presentation of respondents.

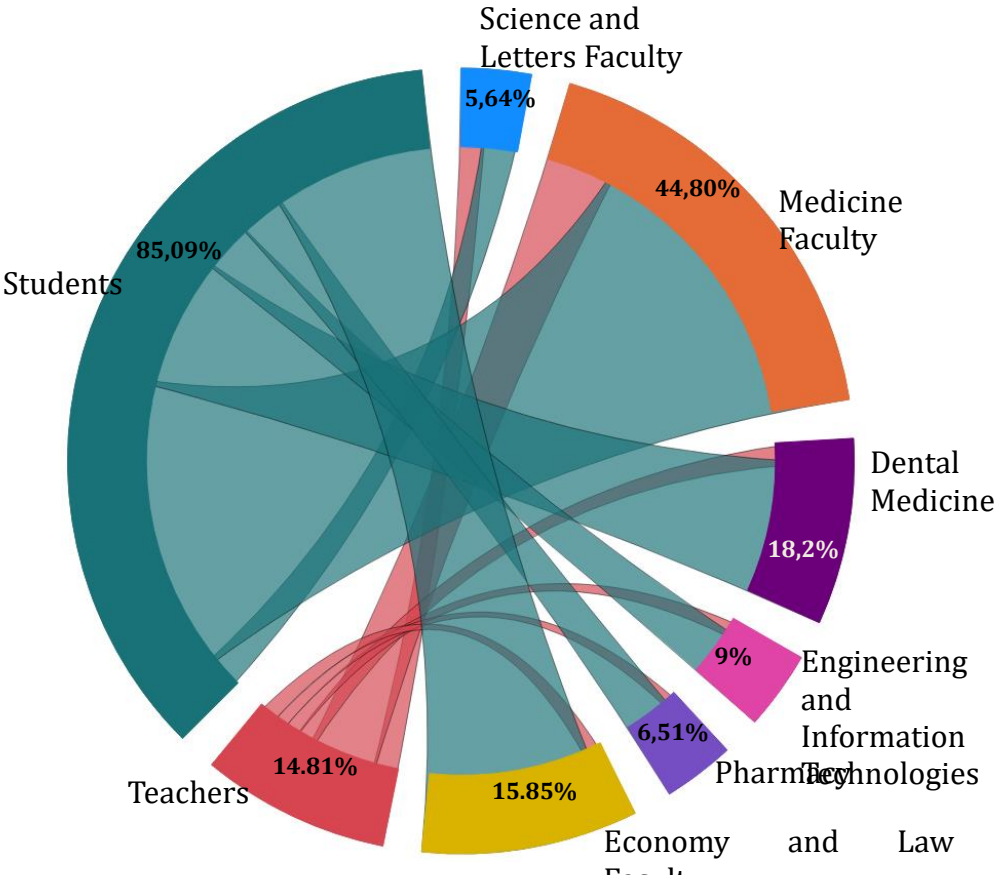


Figure 1. General distribution of respondents by role and faculty
Source: Authors results and representation

As we see in Figure 1, students represent the majority of respondents 1267 students representing 85.09 % of respondents and, 222 teachers or 14.81 % of respondents. About provenience of the respondents we can see that first place took faculty of medicine followed by dental medicine and Economy and Law faculty.

In order to identify what are the most important functionalities available on the platform, users were asked to rate on scale from 1 to 5 the (where 1-not at all and 5 – Essential) following options: Quality of uploaded resources, the importance of online sessions interactions, Independent training activity outside the meetings and Ongoing evaluation.

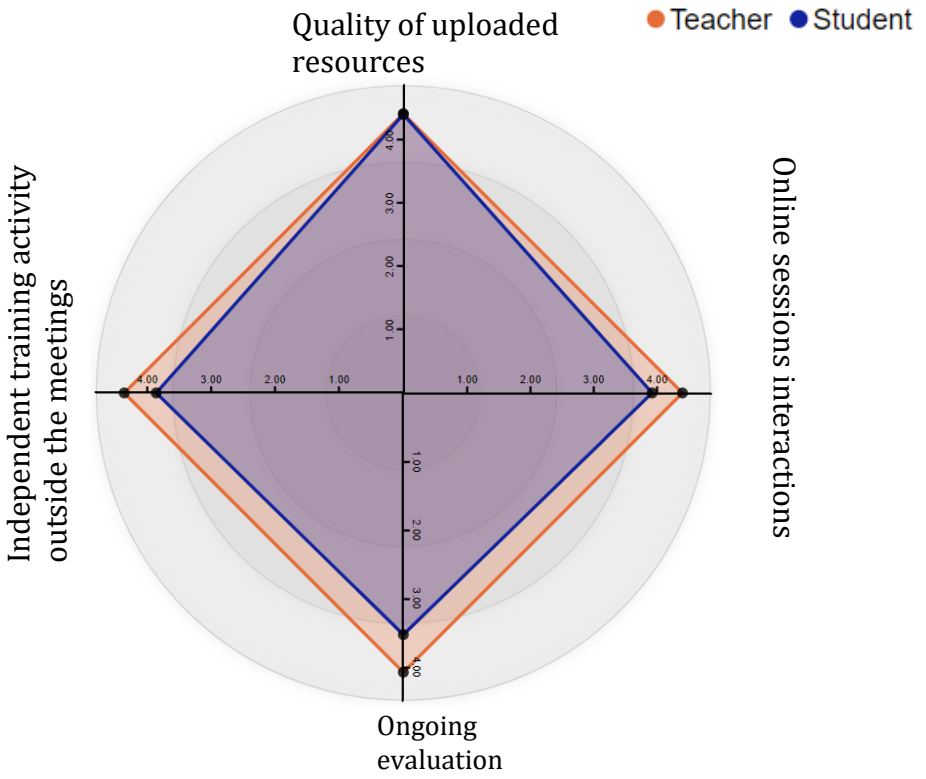


Figure 2. Importance of key pillars of the successful E-learning solution implementation
Source: Authors results and representation

In Figure 2 we can see that both categories, teachers and students, agreed about the importance regarding quality of uploaded resources and rated this pillar by average of 4.4 points. In case of other pillars we see the differences between average points given by respondents and they are as follows: Online sessions interactions, students rated by 3.93 points and teachers 4.41 points; Ongoing evaluation, students of 3.53 points and teachers of 4.08 points; Independent training activity outside the meetings, students – 3.87 and teachers rated by 4.37.

At the next step, respondents were asked to rate the effort needed for adapting to E-learning platform from students' point of view and from teachers` point of view. Also, respondents have to rate the probability that E-learning will substitute Face to Face learning in future.

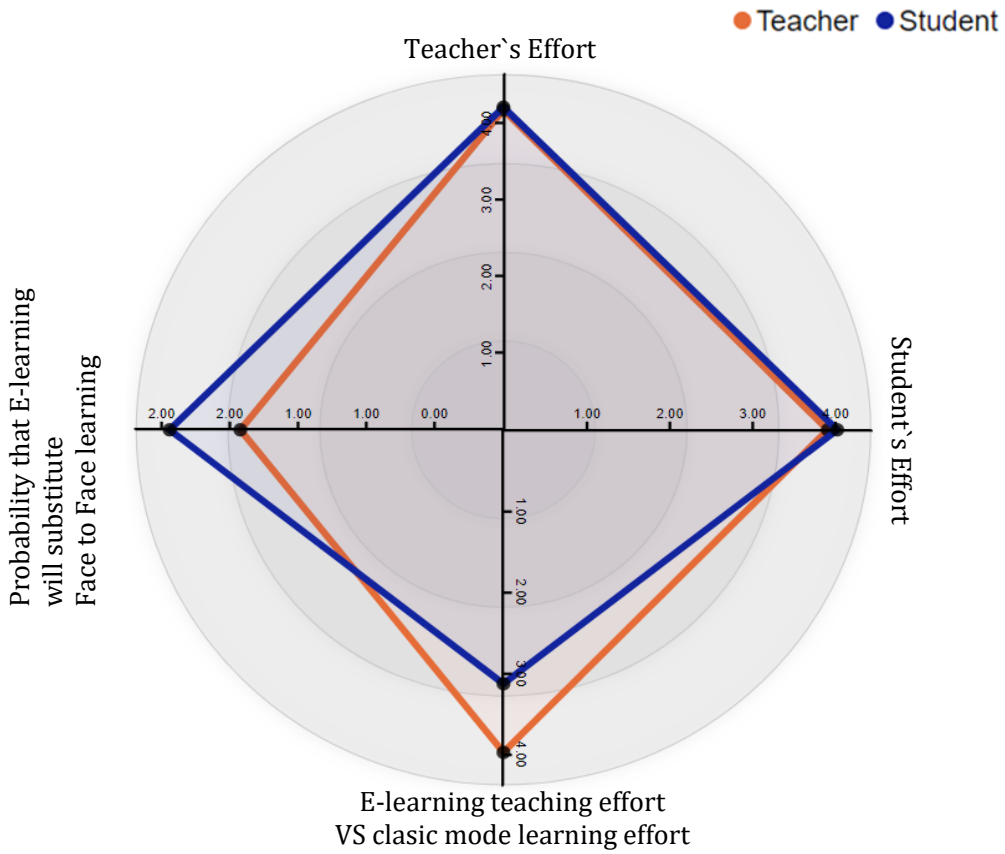


Figure 3. The effort of actors to adapt to E-learning solution
Source: Authors results and representation

In figure 3 we can identify the effort rated by teachers and students needed to adapt to E-learning platform. In case of effort of students, we see that both categories agreed that it is high effort but, students rated their self-effort by average of 4.03 point while teachers rated students` effort by 3.91 points. In case of teachers' effort, teachers rated their effort by 4.18 points while students rated by 4.21 points. As we see, in the second case, respondents are closer in their options but in the first case, teachers underestimated students` effort. Another segment is E-learning teaching effort compared with classic mode learning effort. In this situation we see clear differences between respondents, and it could be influenced by type of courses and resources uploaded which need to be changed for online learning format. As student, this difference could not be visible, maybe just in case of practical specialization where is needed human presence. About probability that E-learning will take place of classic face to face learning,

both categories of respondents rated with low points. Teachers rated by 1.93 points and students by 2.45 points. We assume that students as teachers, are not fully open to change their classic courses to online learning.

Next step is to determine the digital readiness of actors involved in E-learning implementation process and what kind of users we can identify.

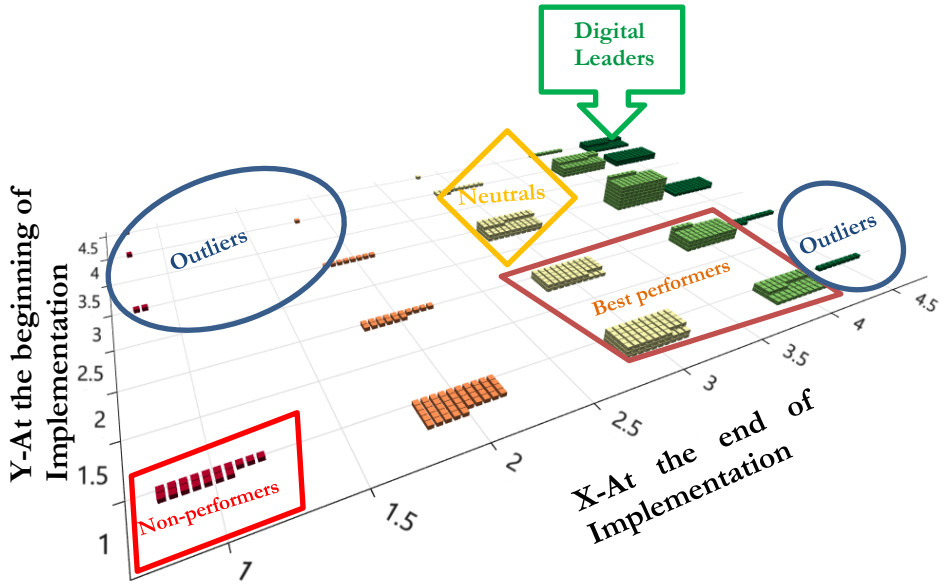


Figure 4. Digital skills of users before and after E-learning system implementation
Source: Authors results and representation

During our analysis we identified different types of users which we will discus in this section. First category of users we wish to discuss are the *Neutrals,* this category of users didn`t improve their digital skills through implementation process. Second category are *Best performers* which passed from low level (1 and 2) of digital competences at the beginning of the implementation to medium and high level (3 and 4) at the end of implementation. Outliers represent the category of respondents with higher deviation from standard behaviour and we will not include in our comments at this moment. Another category of users is *Non-performers*, these users didn`t get involved very well in the process and represented a high reticence for behavioural change. Finally, *Digital Leaders,* represent the users with high digital skills but not always with best performance. These users usually help in implementation process but sometimes is hard to change their minds. Besides this, *Digital leaders* and *Best performers* were the categories which challenged the project team along the implementation process by discovering new functionalities or new critical needs.

6. Discussions

During Covid-19 pandemic, was decided by head of university to split the semester in 2 modules to make the teaching process less frustrating for teachers and learners. The E-learning system implementation started in March 2020 and finished by May 2020 at the end of first teaching module. During all this time, project team applied agile management approach for E-learning system implementation and for users training and feedback. Each of new functionalities of platform were explained to all actors through collaboration platform of the system implemented and through social media channels of the university. These activities supported the digital skills improvement of actors involved. Further research will deepen the analysis of this phenomenon, trying to shape a map of key factors within an environment of influences and to identify and clarify critical aspects, emphasizing the recommendations for project management.

7. Conclusions

The conclusions of this research paper will be structured following the key questions disused above.

- What is the level of actors` digital competences?

As we discussed in figure 4, majority of the users improved their digital skills at least by one point on scale from one to five. During analyses of the data research team discovered different types of performers with specific behaviour but the main attention took Best performers category which passed from 1 or 2 points at beginning of the implementation to 3 or 4 points at the end of implementation process.

- What is the importance of content management through E-learning platform and quality of resources uploaded?

Responders rated as the most important pillar of E-learning system the quality of resources uploaded. In this case, users didn`t exclude the teacher`s content contribution to the courses. Also, the interaction between trainer and trainees was rated as important functionality of the platform.

- What is the effort perceived during the transition process from teachers` and students` perspective?

Generally, effort needed for E-learning platform is higher than in classic courses. Students` effort were underestimated by teachers while in case of teachers` effort, both categories agreed that is high.

- What are the recommendations for successful implementation of E-learning system from human competences perspective?

For successful implementation of E-learning solution project team must identify the actors involved and key competences needed for using the solution. Knowing the users and offer them opportunities to improve digital skills is crucial.

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