

A new academic management vision for the University of Petrosani

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Abstract. We face a period of profound changes in our society, changes that will have effects on education. Today, universities abroad focus on practical things, while in Romania the basis remains the theory. The West European or American higher education institution (HEI) emphasize on dual specializations, internships, business partnerships, and encourage creativity. Abroad, students can get substantial scholarships or have the guarantee of a well-paid job after graduation. In this context, can we give a new face and adapt the higher education system in Romania, in particular in the case of the University of Petrosani, by implementing the hybrid education and developing new applied specializations in collaboration with business partners? We will try to give the answer to this question in this paper.

1 Introduction

The University of Petrosani, the smallest non-vocational university in Romania, the only university located in a city that is not a capital town of the county, a university located in a county that is deindustrializing day by day, is a vulnerable university and need a new managerial vision in the future. One of the authors of this paper is going to elaborate a new complete managerial vision during the year 2023, but two aspects that will influence this new managerial vision are analyzed in this paper, namely hybrid education and dual higher education. The paper aims to analyze these two future trends in Romanian higher education, namely hybrid education and dual education in both the internal and external context of the organization through the managerial research carried out internally in 2022, respectively correlating this research with the observations of the ARACIS (Romanian Agency for Quality Assurance in Higher Education) commission which carried out the institutional evaluation in 2021.

Starting with the year 2023, a new education law will be approved and subsequently implemented in the Romanian education system. Essential aspects for the reform of higher education included in the future law will be strengthening the connection of universities to the socio-economic environment as well as supporting the digitalization program of

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Romanian universities. Strengthening the connection of universities to the socio-economic environment will be achieved by introducing, for the first time at the university level, dual education, as a form of education in which the responsibilities regarding the conduct of learning, teaching and evaluation activities are shared between the accredited higher education institution and economic operators. Also, the support of the digitalization program of Romanian universities will be achieved by financing with one billion lei the digitization of higher education processes in state and private Romanian universities and also the legitimate of online teaching in Romanian universities by means of quality assurance standards assumed by to ARACIS in a manner adapted to the specifics of each field of study and each level of university training (Bachelor/Master/PhD).

Higher Education Institution (HEI) and company from the business sector can develop new applied specializations only in partnerships. This is due to the fact that the competitive nature of today's economic environment has generated a change [1]. The specific knowledge of the disciplines during the study period is not enough for the graduates to have stability on the labour market. The demand for skills for graduates who will get a job immediately after graduation is growing rapidly [2].

Work experience or internship during studies also leads to a positive learning experience and increased employability. However, or perhaps precisely for this reason, higher education institutions (HEIs) everywhere have undergone a process of transformation over the last decade to provide useful skills for future graduates to meet the requirements of the skilled workforce (figure 1) [3].



Fig. 1. Connections between learner, HEI and employer regarding employability skills [4].

2 Theoretical Framework

In this part of the paper, the authors have presented two models needed to implement a new academic management vision for each of the two directions, namely hybrid education and dual higher education, models that are already being implemented in other countries. The authors have identified for the dual model respectively the Industry – HEI partnership, as well as for the hybrid model, the new trends in this fields, namely Industry 5.0, respectively Education 5.0.

2.1 Partnerships between universities and the businesses environment

2.1.1 Model 1 - Amazon Web Services – HEI partnership

In this model, to get started, the lecturer must enroll in the AWS Academy Cloud Foundations program. After a study period (approximately 12 weeks), in which lecturers have access to a full set of lectures, assessments, videos or labs, they can enroll in the AWS Certified Cloud Practitioner (ACCP). Before taking the exam, readers should have a short online video workshop given by their principal technical director.

Next, the next stage, the second, is the choice of teaching materials. The AWS Academy Learning Management System (LMS) platform provides all the resources needed to manage teaching activities. In addition to working with virtual courses, there is a portable data format (PDF) and lecture slides in Microsoft PowerPoint (PPT), lecture videos, white papers, post-reading assessments, exam questions, and labs for each accredited university. Completion of this step is marked by uploading certificates of completion to the AWS LMS transcription area [5].

Basically, the use of an AWS cloud infrastructure allows the digital transformation of colleges or universities in a secure, scalable, flexible, and cost-effective way (figure 2). Such an infrastructure can accelerate research efforts, in addition to supporting teaching and learning. The AWS cloud ensures learning continuity, improves access to learning resources, optimizes the life cycle of institutional data sets. A very important aspect of using AWS is provided by increasing machine learning (ML) capabilities and unlocking artificial intelligence (AI). Real-time streaming capabilities or analysis or business intelligence tools should not be ignored. All this increases efficiency and provides standard users for important activities [6].



Fig. 2. Amazon Web Services (AWS) cloud-based tools at Arizona State University [6].

Arizona State University (ASU) is one of the most representative users of AWS technology. This was done just before the pandemic period and ASU managed to improve the lives of students on student campuses. This was very useful during the COVID-19 pandemic. ASU also offers the video component for almost all courses, just like most universities. In this way, ASU has better adapted to distance learning.

2.1.2 Model 2 – Industry 4.0 – HEI partnership

A significant step in creating strategic value and increasing performance in the economy was Industry 4.0. This concept has been of real interest to many, especially those in industry, IT, but also for business managers. Like any novelty, the changes brought by Industry 4.0 have created opportunities for innovative businesses but have also created risks for conservative businesses. Some of the effects of these changes have shifted to increased organizational complexity or the impact on human resources. Greater organizational complexity has led to better management. Computerization of jobs and their automation has affected jobs. All this has led to an escalation of new specializations [7].

As a result of this situation where mutual needs have increased, the relationship between universities and research institutes and organizations has become more consistent. The organizations realized that they have limited access to capital, equipment, and knowledge, which can be offset by the relationship with research institutes and universities. As for the other two parties, this relationship is extremely important for the outcome of their work. Research institutes want to translate their research into economics, and universities want research and their graduates to find their place in economics. Thus, this collaboration can take place in two ways, formally and informally. Informal cooperation means conducting joint workshops, organizing, and conducting conferences, effectively recruiting qualified staff, training staff, and sharing them among collaborating organizations. Formal collaboration provides tangible results, such as obtaining patents, publishing applied research or obtaining licenses [8].

Industry 4.0, and especially the impact of automation that interferes with multiple processes and implicitly with many professions, leads to changes in terms of education requirements, but also in terms of employee skills. It is about gaining employees with new and different skills, not just about adding the quality of newly recruited employees to the existing skill set. It is estimated that for the successful implementation of digitization, professional and academic training will be a determining factor [9].

Industry 4.0 has changed the productive sector, integrating new technologies such as cloud computing, the Internet of Things, and others, and moved humans away from this sector. This fact had positive effects, but also negative ones. And as a result, Industry 5.0 brings the human back into the manufacturing process, thus being conceptualized to combine human creativity with machine performance (figure 3) [10].

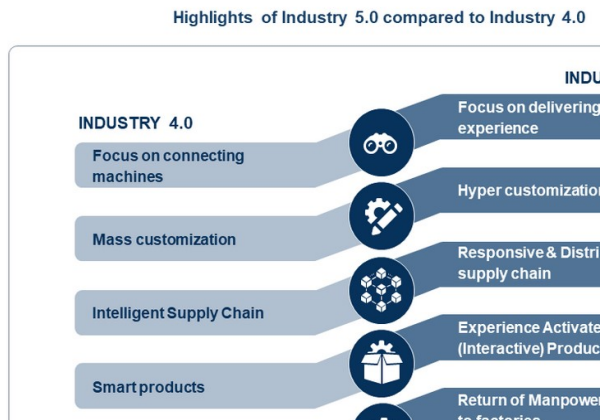


Fig. 3. Highlights of industry 5.0 compared to industry 4.0 [11].

Because Industry 5.0 is not just a replacement for Industry 4.0 or a simple continuation, but a consistent development process, this concept must be used by universities, which must play an extremely active role in defining their future. Balancing focus on man or technology, is the main role of the universities [12].

2.2 Hybrid Education in the context of Education 4.0 and Education 5.0

2.2.1 Model 1 - Hybrid Bachelor of Science Business Management from GISMA Business School

The degree program in Business Management offered by GISMA in a hybrid way is a diverse and dynamic program. This program addresses both the theoretical aspect and the practical component. In terms of fields of study, this bachelor's program provides the knowledge needed for business modelling, digital marketing, and strategic management. A special plus is generated using a systematic hybrid learning scheme. The GISMA infrastructure provides classrooms with the hyflex system that allows students to connect in real time from anywhere in the world. This system allows peer-to-peer learning. It includes: Fundamentals of Strategic Management, General business competencies, Fundamentals of Marketing, Digital Marketing Methods, Leadership in a Digitalized and Globalized World, Financial and Cost Accounting, Project Management, HR Management, Sustainability Management, Digital Transformation and Cases, Digital competencies, Economics and Digital Economics, Innovation Management in a Digital and Globalized World, Specialization: Data Driven Business Models, Entrepreneurship, Business Start-up Simulation Entrepreneurship & Business Modelling, Agile Operations and Pitch Training and Finance and Investment [4].

2.2.2 Model 2 - Education 4.0 and Education 5.0

Peter Drucker said in 1997 that the university would not survive, and higher education is in grave danger. The university campus as an institution will not survive. The current dormitory is completely inappropriate and completely redundant. This is really a prognosis because Paris's innovative university coding was started in 2013 and is open 24 hours a day. There are no teachers, books, or education. Students work on assignments and receive different learning programs at specific levels. When the project is complete, earn points and move on to the next level.

There are many changes to future teaching methods. Educational content, the role of educators and students. We need to reverse the logic of the education system to make it more appropriate & personalize for students. Education 4.0 was recognized as a respond to Industry 4.0, greatly increasing the use of Internet technologies and cross-communication tools. Many other industries are responding to this change in business practices and creating Healthcare 4.0, Technology 4.0, and more. The same is true for the education ecosystem. Education 4.0 is developed for Industry 4.0 and prepares qualified and qualified professionals to prepare for a very global and digital work environment. The evolution follows four steps: Education 1.0: Centuries of memorization practice, Education 2.0: Learning through Internet, Education 3.0: Consumption of knowledge and labour and then Education 4.0: Enables education to create change [13].

The fourth industrial revolution could not be ignored by education. The Education 4.0 concept is in line with the Industry 4.0 concept and aims to transform the future of education. The foundation of Education 4.0 is creativity. Just as Industry 4.0 is called the Fourth Industrial Revolution, Education 4.0 is called the Fourth Revolution in Education.

Thus, according to this concept, a major set of changes must occur in education. The purpose of these changes is the student, who needs to be better prepared for a better response to the challenges he will face. The skills offered to students must be adapted to the needs of the economy. In the new educational process, students must receive access to information and instead of training, they must be led to knowledge (figure 4) [13].



Fig. 4. Major trends of Education 4.0 [13].

Education 5.0 represent the transition to the needs of Society 5.0, adapting new technology to teaching aimed at the social and emotional development of students. Education 5.0 is wants to improve social skills, such as conflict management, collaborative work, and communication. [14]

Because Education 5.0 affects all fields and educational levels, is could be customized according to them. For example, the concept of Engineering Education 5.0, makes the application of technology and its development into the field of humanism and ethics developing new generations of engineers. [15]

3 Methodology and Case Study

The research methodology was based on a survey performed through a questionnaire containing 19 questions and applied on 59 teachers of the University of Petrosani, during 3-5 March 2022. This managerial research was based on the answers provided by 59 teachers of the University of Petroșani, that represent 59% of the investigated teachers and 45% of the total of the university teachers, so it was a representative research. The 19 questions of the survey were organized into 3 sections and 10 directions that could support the future development of the University of Petrosani in the authors opinion, and the relevance of the respondents from the perspective of teaching degree of the teaching staff is presented in the following figure 5.

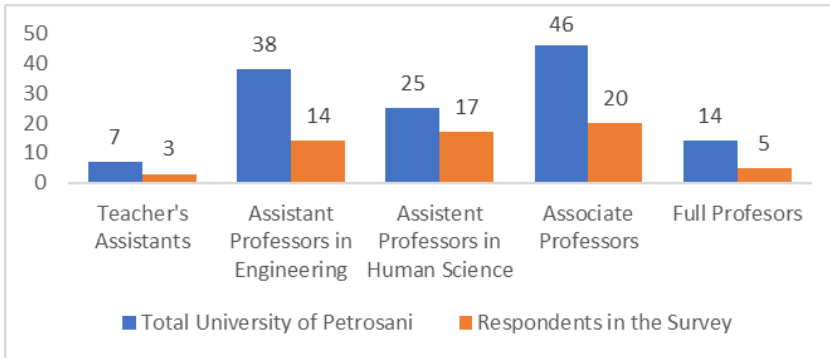


Fig. 5. The relevance of the respondents from the perspective of teaching degree of the teaching staff.

In the context of hybrid education and the partnership with the business environment, the two future directions of development are supported by the results of the managerial research carried out with the help of the teaching staff of the university in March of 2022. We are at the moment when the prospect of returning to the context before the onset of the global pandemic caused by COVID19 no longer exists and not because we no longer want to, but because the world has changed. We have all changed, but society has changed the most, the younger generations have undergone essential changes. We can look to the past for an analysis, but much more important is to look to the future using the experience of everyone in this period.

In the section 2 of the survey dedicated to digital transformation at the University of Petrosani, the authors have stated two directions of development of the university, education infrastructure and educational services in the context of digitalization (figure 6).

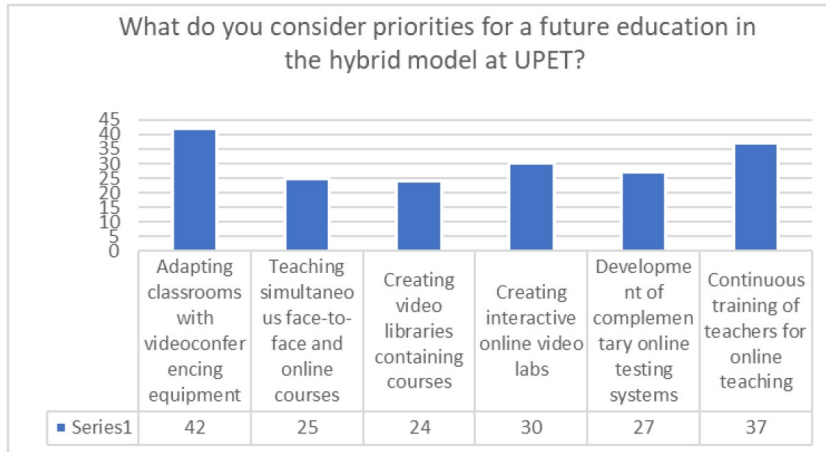


Fig. 6. Question 10 - Direction Educational infrastructure - What do you consider priorities for a future education in the hybrid model at UPET?.

In the context of the answers offered to question 10, the authors hope that adapting the classrooms with videoconference equipment and training of teachers for online education will be a priority of the University of Petrosani in the following 10 years, according to the

project that will be implemented through - Grants for the digitization of universities funded by PNRR 2022 - Component C15: Education Reform 5: Adopt the legislative framework for the digitization of education - Investment 16: Digitization of universities and their preparation for the digital professions of the future (figure 7) [16].

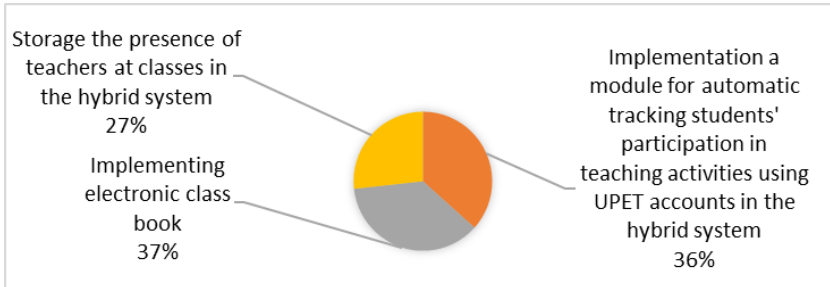


Fig. 7. Question 11 - Direction Educational Services for Digitization - What do you consider priorities for UPET in the field of digitization services?.

In the section 3 of the survey dedicated to the stakeholders of the academic education at the University of Petrosani, considering stakeholders the students, the business environment and the public administration, the authors have stated the use of the benefit of the stakeholders as main development directions for the university (figure 8).

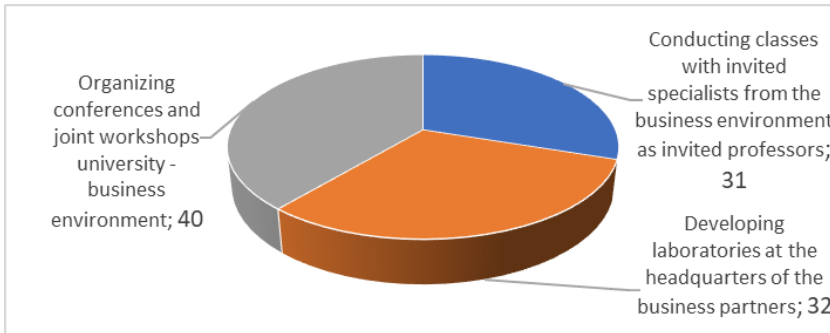


Fig. 8. Question 14 - Direction Business Environment - What do you think should be the priorities of UPET for improving the relationship of teachers with the business environment?.

In the context of developing partnerships between universities and the businesses environment, the answers to question 14 proved the necessity to concentrate universities effort in this direction (figure 9).

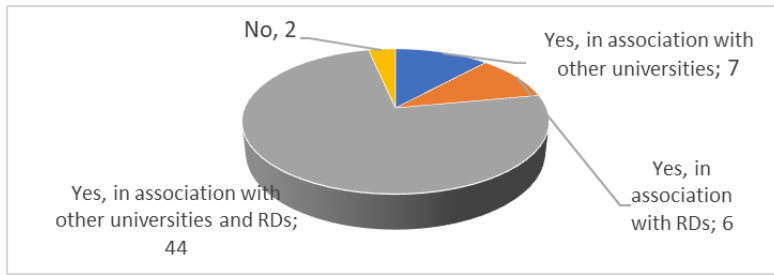


Fig. 9. Question 16 - Direction Business Environment - Do you consider necessary to set up a Science and Technology Park, or a Technological Hub?

The same result is highlighted from question 16, the necessity of developing associations with other research and development institutions or universities (figure 10).

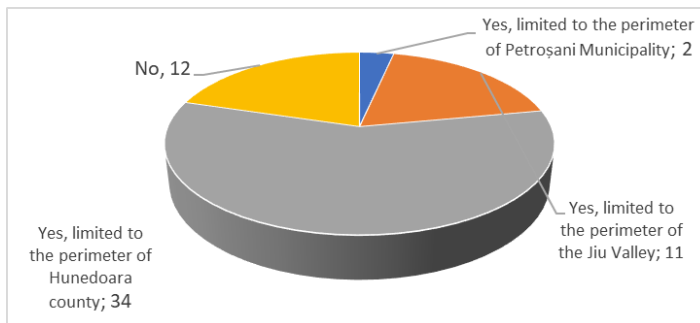


Fig. 10. Question 18 - Direction Local Public Administration - Do you consider it appropriate to create a consortium of innovation and technology transfer together with the local public administration?.

4 Conclusions

Problems regarding hybrid education and dual higher education at the University of Petrosani were identified at institutional evaluation made by ARACIS. So, a large part of the recommendations of the ARACIS commission that evaluated UPET's activity in 2021 are related to the two analyzed aspects [17], aspects that were objectively noticed by UPET's teaching staff, aspects that require remediation in a new managerial vision. The negative aspects noticed by the ARACIS commission presented in *Institutional Assessment Contribution Regarding the External Evaluation the Quality of Academic Education at the University of Petrosani* [18], were the following: Modernize the laboratories and endowment of the laboratories and update some specialized software regarding the fields of study within the University, consulting employers, in a specially organized framework, to discuss the university curriculum in order to improve the correlation between qualifications, occupations and learning outcomes and also a permanent updating of curricula in relation to the progress recorded in the field and the adoption of a unique system for their elaboration by specifying in the curricula the type of activity: fully assisted, partially assisted and unassisted, as well as detailing the modern technical means used in the training activity.

Other negative aspects noticed by the ARACIS commission presented in *The External Institutional Evaluation Report of the ARACIS Student Evaluators for the University of Petroșani* [19], were the following: Development of consolidated links with the business environment that allow the running of internship programs for the amplification of the practical side of the skills conferred on students or master's students, development of institutional emails on the upet.ro domain for students or master's students or doctoral students studying at the University of Petroșani and also increasing the efficiency of using the Academis e-Learning platform through the increased frequency of its access by students and the permanent updating of the content.

One answer to this the question: How can higher education institutions (HEI) prepare students for Education 4.0 and 5.0 in the new blended learning context, in the authors opinion, considering the results of the survey, is that universities must align industry requirements with education. Here are some ways to do this:

1. Curriculum reshaping, taking into account the needs of the future - automation and digitization. A new curriculum, in which these skills are central is very current. In this context, where employers are looking for skilled labour in a poor labour market, hope comes from educational institutions and universities to counterbalance the labour shortage.
2. Developing digital skills - is another way for universities to train well-prepared students for the job market. The combination of software skills and process skills, social skills, along with problem-solving skills, must become indispensable.
3. The option for digital tools for virtual learning environments (face to face) (VLE) - can provide unrestricted access to the learning environment to students from anywhere, if they have access to the Internet, using LMS. This option offers chat facilities, blended learning, teaching, and learning support and much more.
4. Changing course teaching - to better adapt to the cognitive changes of students in modern times.
5. Education 5.0 represent the support of the development of the new society, Society 5.0, in which the human-technology balance is important, the society where people will collaborate with machines having a cognitive excellence. In this context Educators 5.0, aims to provide quality education according to the needs and abilities of students.

The solutions for solving these problems at the University of Petrosani and also for applying the results of the managerial research, obviously requires a new managerial vision, totally changed compared to the one implemented in the period 2020-2022, a vision that contains a strong IT component, an adaptation of the teaching staff and an intense involvement of the business environment. In conclusion, all universities, including the University of Petroșani, should start a process of adaptation, mainly of teaching techniques. The interesting feature of a more attractive and fun learning process must be the new smart approach to learning. This adaptation must also include classrooms infrastructure, curriculum change and the learning approach, as they are all intertwined.

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