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**INNOVATION IN HIGHER EDUCATION –  
WHAT CAN WE LEARN FROM THE CORPORATE SECTOR?**

**Abstract:** Our study examines what higher education can use from the experiences and methods of the industrial-business world to ensure its own sustainability. The topicality of our question is based on the closer relationship between industry and higher education. Therefore, the methods of higher education can only be interpreted in their wider environment, which also has its own successful answers. The independent and cooperative strategies increase the effectiveness via sharing and concentration of knowledge and resources. The application of these strategies in education appears as an innovation and fundamentally transforms the traditional approach. We highlight the specifics of the application of business-industry methods in higher education, the emergence of external methods, procedures, and standards. These amend the traditional approach of higher education and enhance sustainability. The application of business experiences and methods can make a significant innovative contribution to the sustainability of higher education.

**Keywords:** cooperation, higher education, innovation, knowledge, strategy.

## 1. Introduction

What does sustainability of higher education mean? The term has a double meaning. On the one hand, it means global environmental implementation of sustainability in higher education (energy and material saving, reduction of carbon footprint), on the other hand, it means basing the future survival and development of higher education on internal resources, creating a “self-sufficient” higher education. In this study, we focus only on this second meaning. We examine the foundation of the future of higher education not in itself, but in its own economic environment. The basis of this approach is the industry-university collaboration is becoming more and more frequent and closer, and the fact that the financial basis for the development of higher education can primarily be created from the results of the knowledge-intensive economy. Due to the limitations of the scope, our overview is not complete, we present only a few of the principles and methods used in the industry, which can be used to ensure the sustainability of higher education. These are methods that, together with learning content adapted to the renewable needs of the labour market, represent a significant capacity for innovation.

## 2. Theoretical framework

Today, we live in the era of Industry 4.0. An almost organic relationship has developed between man and machine. No one is surprised anymore if “surgeon doctor” Da Vinci Xi. When the first assembly line started in Henry Ford’s Michigan plant in 1913, industrial production changed radically. Nowadays, robots often assemble even next to the assembly line, and even machines provide our everyday infrastructure, organise, and manage more and more areas of our lives. To be able to live and work with them requires knowledge and skills that no one thought of a generation or two ago. This apparent paradox can be resolved: we do not teach the profession itself, but the skills required to acquire it. Ford’s assembly line sped up production, and now our whole life has sped up. Adapting to the new pace is difficult, stress and its consequences are becoming more frequent. However, if we

choose a different point of view and look at change as an opportunity, it can benefit us. The previous approach, according to which life educates for life (Barbaró & Weisz, 2006), is no longer relevant: you can only enter life with preparation. That is why training and education have a key role in the sustainability of Industry 4.0.

The current digital transformation provides humanity with the opportunity to reduce working hours, and the meaningful use of increased leisure time will be one of the key challenges of the near future. There is no doubt that for certain groups in society, at certain times, this search for a path will be a bitter one, probably with many—hopefully temporary—setbacks, as well as despair and uncertainty. However, the whole process can be viewed positively: on the one hand, digital transformation opens a wide range of opportunities for a more dignified life, and on the other hand, from an economic point of view, digitalization will be an unavoidable element of competition, reducing marginal costs (Szabó-Szentgróti et. al, 2021; Ton et. al, 2022).

Why are we looking for a solution in the sustainability methods of industry? The rise of automation, robotization and digitization associated with Industry 4.0 results in significant changes not only in the economy, but in all areas of life. The prominence of innovation processes and the knowledge-based economy have a serious impact on the relationship between science, technology, innovation and the economy. One of the main drivers of competitiveness based on technological changes and innovations is innovative enterprises and universities. Thus, cooperation between industrial players and higher education institutions became more and more valuable, and it became inevitable to redesign higher education courses and adapt them to the needs of market players. Further strengthening of relations between higher education and companies, and greater channeling of market demands and private capital into the education system. In this way, students can more easily and flexibly adapt to the constantly changing needs of the labor market (Al Danaf and Berke, 2021). This is in connection with result of Kőműves, Hollósy-Vadász, Szabó (2021) who scanned a Hungarian University. According to their result the students are not satisfied with the teaching system because they think it does not focus on the practical knowledge.

Just as we plant new trees to replace the trees of the cut down forests, today's specialists will also need to be replaced in order to continue sustainable development. This supply is taught and educated by the education system. The task of primary education is to teach basic competencies that have remained unchanged for centuries: without reading, writing, arithmetic, and reading comprehension, the other competencies cannot be taught. Although newer and newer teaching methods and tools appear, the methods crystallised in primary education are still needed today. Higher education is characterised by completely different dimensions. Graduates who graduate here enter the labour market directly, and their livelihood and future depend on what they learned during their university years. They need to know what they can use to prevail and be competitive.

### 3. Methodology

Today's students need to be prepared for professions that we don't even know exist today. The curriculum is now largely dictated by market expectations. It is no coincidence that cooperation between industry and higher education, which is a bilateral relationship, is becoming more and more common. The universities provide their resources for practical research, and the industry entrusts the universities with the training of the workforce of the future, also specifying the output expectations.

However, due to the marketization of higher education and its close intertwining with industry, it fundamentally changes the ideas about the future of higher education. We cannot talk about the future or sustainability of higher education by separating universities from the corporate sector that is almost fused with them. Their sustainability cannot be imagined without each other. In this study, we therefore examine what methods and knowledge higher education can take from companies to maintain its own sustainability. This approach is also appropriate because the industry has accumulated the highest level of sustainability knowledge. We present some of these experiences that can also be used in higher education in our study.

## 4. Results

We begin the review with a strategy that was not born in the era of Industry 4.0, but whose true significance is only felt today. This is the blue ocean strategy. Today, scientific, and technical development has already reached the level at which the time of solitary innovators and inventors is over, results and breakthroughs can only be achieved through teamwork. The only way to reach hitherto unconquered fields of science is to use the results and experiences of the work already done by others. That is, we use external knowledge integrated into internal processes. A good example of this is the bankruptcy of the Canadian telephone company Nortel, when the company sold its patents to satisfy the demands of creditors. The Apple-Ericsson-Microsoft-Sony consortium was only able to purchase these patents from the Google-Intel alliance, which also joined the alliance, by pooling their resources. The high purchase prices are a good indication of the value of all knowledge and procedures that the company does not have to develop at the expense of money and time. This is so true that great innovators can even abuse the indispensability of the knowledge they possess. This was shown by the Nokia-Daimler dispute. So, what is it about? The time available for development is short, so the process requires significant additional financial resources. Therefore, the basis of modern innovation is cooperation between companies. This is nothing more than the implementation of the so-called “blue ocean” approach in the field of Research and Development (R&D), here it is called open innovation. The essence of blue ocean is therefore cooperation. How does this make higher education sustainable? On the one hand, industry can support research from its revenues (industry-higher education cooperation). On the other hand, universities can also share their resources with each other to obtain mutual benefits - this is the appearance of the blue ocean in sustainable higher education.

The sustainability of higher education can be examined at the level of institutions or higher education as a whole, but in our opinion, we can only see the full picture if we look at higher education together with its environment, i.e., embedded in the economy and the corporate sphere. In our opinion, this approach is also important because the intertwining of industry and

higher education is becoming more and more powerful, and therefore the future of both cannot be imagined without each other.

Kantabutra (2017) lists five factors that can ensure corporate sustainability (Figure 1). These are: perseverance, resilience, moderation, geosocial development, sharing. He adds reasonableness as the sixth, although in our opinion this is the most important element in any case. These factors enable sustainability, which can be characterised by good performance, crisis resistance and community benefit.

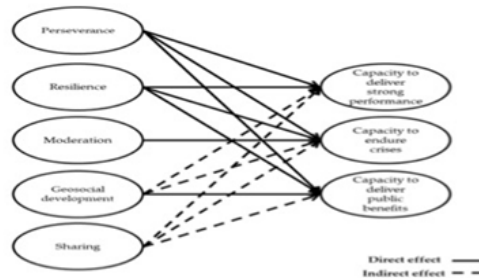


Figure 1. Factors of organizational sustainability (Kantabutra, 2017, p.4164)

According to the figure, the effect of Sharing is only indirect. However, when analysing the effects directly and indirectly in addition to effect, the value of the total (direct + indirect) effect is also usually given. Although this is not mentioned in the cited work, in our opinion it is one of the most important factors of sustainability. This Sharing is the blue ocean strategy mentioned above. Sharing, therefore, primarily means the internal and external sharing of knowledge both in the corporate and higher education fields, but it should also be extended to the sharing of resources. The purpose of internal sharing is innovation, but external sharing also aims to build the brand. Another interesting result of the model is that Moderation, which in this model means the management of the organization, only affects crisis resistance, because achieving good performance is at least as much a managerial task as ensuring stability. Management tasks related to performance include, for example, quality management (Yusr et al., 2017) and making strategic decisions (Ooi, 2014) based on the appropriate information collected and presented to the department by experts.

The management's tasks related to institutional sustainability are diverse. However, in fact, their implementation is simple, only three activities need to be decided and acted upon properly. The purpose of standardization is to increase robustness and flexibility. This can be achieved, for example, by creating unified education platforms that make the education process easier and user-friendly for both instructors and students. The result of modularisation is reduced costs and risks. This enables the efficient reuse of standard building blocks and creates a modular system with a common structure. The goal is to break down a complex higher education structure into standardised modules, each of which can be easily replaced and reused. A good example of this is the system of educational modules. If the individual modules have a standardised design, they can be used in the teaching of several subjects. We mention business law as a practical example, this module will be used for the education of both lawyers and economic specialists. Tracking the changes only needs to be done in one module, but the results can be used both in the education of law and economics. The goal of rationalization is improved experience. For this purpose, we remove unnecessary or redundant elements, thereby reducing the monotony of learning content.

Shared knowledge is also a guarantee of quality, because only valuable knowledge is received with interest by external parties. That is, the issue of knowledge sharing is inseparable from quality management, which appears in the areas of acquisition and sharing and application of knowledge, but according to the literature, it has only a negligible effect on the. Among the areas related to knowledge, knowledge creation means new knowledge elements born from the use of existing knowledge through research and innovation. The knowledge acquisition comes from information from suppliers, customers and employees and plays an important role in continuous product and service development. The knowledge sharing means the sharing of quality assurance, skills and experiences, which is complemented by the involvement of all stakeholders in decision-making, knowledge and by application we mean the practical use of knowledge acquired from different sources.

How can this be realised in higher education? By their very nature, universities and colleges are bases and distributors of modern knowledge, so knowledge creation incubators. Higher education institutions can be seen as

think tanks that can process and interpret previously collected information from outside higher education on the most up-to-date theoretical basis (knowledge acquisition) as well. The knowledge One of the best indicators of creation is higher education rankings based on statistical data (e.g., the number of publications). To fulfill this function, universities must transform their traditional teaching methods. They should not use the reading lectures of medieval model universities that were famous in their own time, but they should look even further back to ancient Greece for a good example. Figure 2 illustrates this idea well. The modern university is an open, student-attracting institution based on Platonic traditions that can be visited or left at any time, a meeting place for the exchange of ideas and experiences, the common sharing of knowledge, and the birth of fruitful ideas. The Stanford2025 project also targets this output.



Figure 2. Raphael: The School of Athens (Source: <https://wall.alphacoders.com/tag/the-school-of-athens-wallpapers>)

Here, the instructor is more of a catalyst who creates the right atmosphere for the learning process. An important element of the change is the self-organization of the students, and this already leads to the area of internal knowledge sharing. A typical positive example of self-organization is Peter Weir's (1989) film *Dead Poets Society*. Research has proven the effectiveness of this model for almost a decade. The fact that students are still sitting on the bench, despite this, indicates that the transition is difficult or that the resistance to it is high (or both answers are true). Self-organization is one of the keys to interactivity, which is the World Economic Forum (WEF) Executive Opinions According to its survey report, it can still be said to be widespread in only a small part of the world (Figure 3).





Figure 3. Educational styles in the countries of the world (Source: WEF, 2020, p.5)

Remember that in Peter Weir's (1989) film, the modern initiative failed due to the resistance of the school management and the teaching staff! However, this transformation must be carried out precisely for the sake of sustainability. The fact that we can properly examine the sustainability of higher education only in its economic environment is clearly indicated by the fact that the WEF was the organization that announced the Education 4.0 framework in connection with Industry 4.0 (Figure 4). It is also global framework for shifting learning content and experiences towards the needs of the future. The most important innovation in the program's approach is that skills no longer support learning, but represent learning content, i.e., the Education 4.0 concept no longer teaches students about knowledge, but about learning itself, the most effective ways that can be applied independently. In order for the students to master this, it does not expect skills, but experiences leveraging innovative pedagogical. The external knowledge sharing can take place in two directions. One is the collaboration between industry and higher education, in which the universities created sources of knowledge for the industry, in return they receive up-to-date practical experience and knowledge from the industry. The other way is knowledge between educational institutions sharing, the value of this has already been discussed in connection with the blue ocean strategy.



Figure 4. Education 4.0 framework (Source: WEF, 2020, p.7)

## Discussion

In our modern world, real innovations, their creation, and results depend on several internal and external conditions. We must realize that the basis of the creativity of individuals, universities, and future societies is deep and at the same time comprehensive intellectual preparation. Therefore, innovation presupposes broad professional training and real flexibility that can even facilitate career changes. This, in turn, makes it necessary that the appropriate professional contents and output requirements are adapted to the needs of employers.

The realization of sustainability in higher education must also be pursued in the same three areas as in a company: portfolio, costs, organization and operations. The main issue of the portfolio in higher education is to provide up-to-date knowledge in a manner appropriate to the content. The old paradigm is that the student's modality (auditory, visual, kinesthetic) can be used to effectively teach the curriculum, it can no longer be used. Yet many people advertise this, despite the fact that it has been out-of-date for a decade. Since then, we have known that the modality of the learning content is the determining factor: Anatomy must be taught visually, high jump kinesthetically - otherwise we are guaranteed to fail (Rohrer & Pashler, 2012). The simplicity and expediency of compiling the portfolio is enhanced by the student experience, on the other hand, also reduces the workload of portfolio management (instructors and administrative staff). This area

includes the establishment of a stable network of connections between companies and higher education institutions, which allows focusing on the core business (i.e., education) while maintaining flexibility and increasing profitability.

In the area of costs, thoughtfully organised processes reduce the number of unnecessary repetitions and enable the automation of several activities. This can reduce the workload of instructors and students, as well as costs. The reduction of unnecessary repetitions also reduces the likelihood of risks, which is also a cost-reducing factor. The transparent design of processes has a similar effect. Appropriate design of the organizational and operational level increases reliability, making it easier to filter out and solve the causes of disruptions. Rapid decision-making and adaptation become possible, which ensures strategic flexibility and compliance with changing environmental requirements.

Of course, there is no universal recipe, if there was, everyone would work according to it. The practice of sustainability also has its limits. One of these is the culture in which higher education operates. For example, standardization may violate certain norms in the given community, so it can only be applied in cases where there are no intercultural differences. Similarly, the local or regional legal order or regulation with which sustainability activities may collide represents limits. The rationalization, standardization and modularization of the portfolio can quickly reach its limits: these are mostly characterised by personalization. For businesses that sell exclusive products and price accordingly, this is not a problem, but customizing a curriculum no longer pays off for creators of learning content.

So, in fact, this innovation is one of the pillars of the paradigm shift taking place in education. The change in model results in a higher education that is more open to the needs of the economy, cooperates more closely and efficiently with companies, and uses the language of quality and performance.

## 5. Conclusions

In our study, without striving for completeness, we have only touched on a few areas in which the knowledge and experience of companies can also be utilised by higher education. In today's higher education, revolutionary changes are taking place in the same way as in other areas of the economy. But in higher education, these processes started almost a decade later. That's why it's worth studying the corporate experiences of that decade and using them as a starting point to take advantage of the lag. That is, to use ready-made knowledge, just like in the mentioned Nortel case.

In today's increasingly complex world, more and more disruptive influences appear. In higher education, such are the increasingly rapidly changing student and labour market needs, and new competitors (institutions with a similar profile) appear. Some institutions are responding with new administrative burdens, new rules, and new protocols to manage the complexity. However, such responses add complexity, are counterproductive, and hinder performance. Many companies and many institutions have the knowledge and skills they need to achieve sustainability. But they still end up failing because they use the wrong approach. Historical approaches and classical management rules often result in lagging in today's world because they do not address the fact that performance results from people's actions - their behavior. Therefore, new and innovative approaches are needed. The sustainability of higher education in the context of Industry 4.0 today means much more than saving paper and carbon at universities reducing their footprint. The intertwining of industry and higher education has now reached such a degree that they can only be examined together from the point of view of sustainability. We reviewed some business models that can be used to create sustainable higher education. Of course, we haven't covered everything. We could have talked about teacher and student mobility in connection with sharing, and the concentration or redistribution of financial resources in connection with costs, but this was not our goal. We only wanted to draw attention to the fact that the application of business experiences and methods can significantly contribute to the sustainability of higher education.

For educational institutions - from elementary schools to universities - so that the world can constantly develop and adapt in order to fulfill its basic mission, that is, to properly prepare students and students for work and the challenges that arise in other areas of life. After all, our world is increasingly complex and interconnected, and we are witnessing rapid technological, cultural, economic and demographic changes.

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