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THE METAVERSE AS A NEW ENVIRONMENT FOR THE FUNCTIONING OF HIGHER EDUCATION: LEGAL IMPLICATIONS

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Abstract. The future presents us with a multitude of challenges and opportunities, among which the advancement of the internet and artificial intelligence plays a significant role. This development is driving the digital transformation of numerous sectors of the economy, including education. These changes extend well beyond the implementation of basic tools, such as Learning Management Systems (e.g., Moodle) or platforms for synchronous instruction (e.g., MS Teams, Google Classroom). The current evolution of education is shifting towards migrating the entire university infrastructure into virtual reality environments, managed by advanced artificial intelligence systems, which allow for participation in the educational process through means such as avatars. The aim of this article is to analyse the conditions, barriers, and possible trajectories of the transformation of higher education institutions towards the metaversity model. The following sections discuss the concept of the metaversity and its theoretical foundations, the current regulatory framework and its constraining impact on the implementation of hybrid and virtual models, as well as the characteristics – or, more precisely, the functionalities – of an effective metaversity model.

Keywords: university; metawersum; virtual reality; on-line education; studies.

INTRODUCTION

The dynamic development of immersive technologies, including virtual reality (VR) and augmented reality (AR), together with the ongoing expansion of the metaverse concept within the social and economic spheres, poses a fundamental question for higher education institutions regarding the future shape of academic education. The traditional model of teaching and learning, grounded in the paradigm of direct interaction between lecturer and student within the physical classroom environment, is now being confronted with the vision of a university operating in a virtual environment – a metaversity – in which both academic staff and students participate in the educational process through avatars, moving freely among modules,

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courses, and knowledge spaces in accordance with their individual interests and professional aspirations.

This perspective, although increasingly technologically feasible, remains in significant conflict with the existing formal and legal frameworks governing the organisation of education in Poland and many other European countries. Regulations impose a requirement for classes to be conducted in synchronous mode, thereby establishing direct didactic contact as a normative standard. At the same time, rigid curricular frameworks, designed to meet the learning outcomes required by the European Qualifications Framework, do not provide for a flexible, personalised selection of modules corresponding to an individual student's professional development pathway.

Nevertheless, a number of indications suggest that institutions which undertake the earliest strategic preparations for this transformation will gain a lasting competitive advantage in the competition for future students. The university ceases to be perceived solely as a linear setting for the implementation of a multi-year study programme and instead becomes a cafeteria-style educational platform – an environment enabling a selective, dynamic, and labour-market-responsive choice of educational content. In this view, studies are no longer a one-time stage of an educational biography confined between the ages of twenty and twenty-five, but rather become a continuous process, undertaken repeatedly and at various stages of professional career development.

The formal dimension of this transformation is, however, inseparable from its technological and generational dimensions. Generations Z, Alpha, and Beta – currently entering or soon to enter the higher education system – have already developed a natural capacity to function within a dual reality: physical and virtual. For these demographic groups, the metaverse environment does not constitute a novelty requiring adaptation; rather, it is a familiar space with which they have been acquainted from an early age. A university that ignores this fundamental cultural shift risks marginalisation within the educational system of the future.

The aim of this article is to analyse the conditions, barriers, and possible trajectories of the transformation of higher education institutions towards the metaversity model. The following sections discuss the concept of the metaversity and its theoretical foundations, the current regulatory framework and its constraining impact on the implementation of hybrid and virtual models, as well as the characteristics – or, more precisely, the functionalities – of an effective metaversity model. The article employs the desk research method, drawing upon the existing literature, primarily scientific articles, as well as selected legal regulations.

1. THE CONCEPT OF A UNIVERSITY IN METAVERSE, I.E. METAVERSITY

A significant portion of the world as we know it is shifting into virtual reality, and the Internet is becoming the primary space for everyday human activity. Many intangible services – such as financial transactions, online shopping, and the remote handling of administrative matters – are now widely available online. In this context, it should come as no surprise that educational services, albeit to varying degrees across different regions of the world, are also increasingly being delivered on a larger scale within the digital environment.

However, the metaverse is not merely about individual elements accessible via the Internet. The term, first used in 1992 by Neal Stephenson in his science fiction novel, referred to a space in which characters, represented by three-dimensional computer-generated avatars, interacted directly with one another. Although initially a work of literary fiction, the concept has become permanently embedded in both the vocabulary and the technological reality of the transition from the twentieth to the twenty-first century.

In this way, virtual reality does not merely entail the presence of universities on social media or the provision of online courses via e-learning platforms (such as Moodle or MOOCs) or online meetings and lectures conducted in synchronous mode. This technological shift redefines the traditional approach to didactics, ushering us into the era of education in the metaverse. With the development of virtual reality operating in parallel with the physical world, universities must also undergo a transformation into "meta-universities" in order to survive and remain relevant institutions [Hassanzadeh 2022, 11].

A metaversity can be designed as a "digital twin" or replica of a real-world university, into which student avatars enter and may freely move around the campus. A research team from Milan led by Di Natale emphasizes that many universities are reproducing their campuses in the metaverse, enabling students to take virtual walks, hold meetings, and participate in classes [Di Natale, Repetto Costantini, et al. 2024, 30] without the need for prior acclimatisation or relearning the campus topography. Such a university becomes a digital replica of the real world, reproducing its culture and physical landscape, including buildings, roads, waterways, streams, and architectural structures. To create such a model, data from unmanned aerial vehicles and 3D point cloud modelling are used, as was the case in the already developed virtual project of Hubei University of Technology in Wuhan, China [Han, Hu, Tan, et al. 2023, 1176].

An important conceptual assumption of the academic metaverse is a departure from a reductionist understanding of virtual university space as merely a digital reconstruction of physical infrastructure. Although faithful

reproduction of the campus – including faculty buildings, administrative spaces, and environmental elements – constitutes an essential foundation of spatial immersion, the true potential of the academic metaverse is realised only at the socio-cultural dimension.

This environment should enable multidimensional interaction among all stakeholders of an academic institution – primarily the student community, but also academic teaching staff and administrative personnel. A fundamental objective is therefore to overcome the model of one-way communication that dominated the space of remote education during the pandemic period, which was characterised by students' passive reception of content and a lack of tools for active participation. The academic metaverse should constitute a living learning space, integrating didactic functions with cultural and social activity.

From a technical and design perspective, the implementation of this vision requires the creation of a comprehensive application platform whose architecture should take into account a range of key properties. As research conducted by Chinese scholars in this area indicates, potential users highly value the following features of a virtual environment [ibid., 1177]: a) high-quality visual design, including the possibility of virtual campus tours, b) an intuitive user interface ensuring a low entry threshold, c) voice interaction as a natural communication channel, d) gamification elements enabling the completion of educational tasks in an engaging form, e) multi-path navigation corresponding to diverse purposes and user styles of platform engagement, f) mobile device compatibility, ensuring accessibility of the environment regardless of the usage context.

Aesthetical aspects of the virtual environment – such as the presence of campus greenery elements – are also not without significance. Although seemingly marginal, they substantially influence the perceived authenticity of the space as well as users' level of identification with the university.

Similar conclusions regarding readiness, capabilities, and the level of acceptance of immersive technologies among students were formulated by researchers from Jordan, who conducted empirical studies on student groups [Samed, Amer Al-Adwan, Nour Awni Albelbisi, et al. 2023, 15385]. In light of the obtained results, the key predictor of the intention to use virtual reality proved to be perceived usefulness of the technology – understood as its practical value in the teaching and learning process – as well as ease of use and the sense of enjoyment accompanying its application. These factors demonstrated a significant positive effect on students' willingness to adopt innovative educational solutions.

On the other hand, as the main barriers limiting readiness to use education in a virtual environment, respondents indicated factors related to digital security – including the risk of cyberattacks – as well as concerns regarding privacy protection and potential misuse of personal data. It is worth

emphasising that this phenomenon is particularly significant: a generation raised in conditions of simultaneous participation in both the real and virtual worlds demonstrates an enhanced awareness of the risks inherent in both spaces. The surveyed students articulated specific concerns regarding the possibility of secondary use of behavioural data – particularly information on visual attention directed at specific elements of the virtual environment, recorded via specialised VR headsets equipped with eye-tracking technology – for purposes inconsistent with their original intent or infringing users' interests. This also includes issues related to the protection of personal data of users (students, academic staff, and administration), as well as the potential problem of safeguarding classified information that may be processed within universities [Rzewuski 2025, 515], particularly military universities.

2. FEATURES OF THE UNIVERSITY OF THE FUTURE: BENEFITS AND RISKS

In order for a university operating in a metaverse environment to properly fulfil its teaching objectives and meet the expectations placed upon it in terms of improving the quality of education, it must satisfy a range of complex requirements of a technical, pedagogical, and organisational nature.

2.1.

A particularly important issue in the context of a metaversity is ensuring genuine accessibility for users with diverse needs. In a futuristic vision of higher education, this issue should not be reduced solely to the adaptation of educational materials for persons with disabilities in the traditional sense [Russ and Hamini 2021, 2]. Instead, a more appropriate approach appears to be the consistent application of the principles of universal design for learning (UDL), which assume the creation of educational environments and resources accessible to the widest possible range of users – regardless of the type and degree of potential sensory, motor, or cognitive impairments.

In this context, teaching methods used in a metaversity should be characterised by diversity and adaptability to the individual user profile. A desirable solution would be the implementation of artificial intelligence-based mechanisms capable of dynamically adjusting the form of presented content, the pace of its delivery, and its level of difficulty to the identified aptitudes and cognitive preferences of a given student. Of particular importance here is the consideration of dominant learning styles, as individuals with visual (visual learners), auditory (auditory learners), and kinesthetic (kinesthetic learners) preferences have different needs.

Within the framework of the outlined concept, an important epistemological and pedagogical question emerges: does the instructor have to be an avatar representing a real human being, or can this role be fully assumed by a properly designed Large Language Model (LLM)? The answer to this question is not unequivocal. On the one hand, the presence of a human teacher ensures the authenticity of the pedagogical relationship, empathy, and the ability to respond to complex, unpredictable teaching situations. On the other hand, an advanced LLM can provide 24/7 availability, unlimited patience, and – particularly relevant in the context of the adaptive mechanisms described above – consistent personalisation of the learning process. It therefore appears reasonable to consider a hybrid model in which artificial intelligence performs supportive and automating functions, while substantive oversight and the relational dimension of education remain within the domain of humans.

2.2.

It follows that another important characteristic is self-adaptation and flexibility. A well-designed educational platform based on artificial intelligence models should adjust to the learner's pace of work and enable access to educational services at any time. Classes should give the impression of being conducted in a real-time university classroom, be engaging and interactive, and not be limited merely to downloadable or pre-recorded materials. In such classes, the problem of attention being distracted by the activity of other users would not occur, which is a frequent challenge in maintaining concentration among pupils and students.

At the same time, when designing classes, the perceptual capacities of learners must be taken into account: online classes, even if highly interesting and engaging, should be divided into shorter modules than 45-minute units.

2.3.

Another proposed stage of development is the full virtualisation of administrative processes, eliminating the need for physical presence at an academic unit in order to complete formalities such as submitting assignments or signing declarations of originality. Although, in the current state of most Polish universities, full digitalisation of these procedures is not yet fully achievable, the ongoing digital transformation of the higher education sector is leading to the implementation of solutions such as e-files and e-dean's office systems, enabling remote handling of student affairs. An important tool supporting user authentication processes is integration with public identity platforms, including trusted profiles. In the long-term perspective (the university of the future), it is expected that traditional administrative support provided by dean's office

staff or educational administration units will be supplemented or replaced by intelligent systems supported by artificial intelligence, capable of ongoing communication with users. Moreover, a highly functional solution would be the implementation of automated systems for notifying students about examination dates, as well as personalised real-time administrative support.

2.4.

An undeniable advantage of a university operating exclusively in a virtual environment is its potentially significant positive impact on the natural environment. An institution functioning solely in cyberspace would not require physical commuting by participants in the teaching and learning process, which would directly translate into a reduction in transport-related emissions. Moreover, typical sources of environmental burden associated with traditional academic campuses – such as the generation of solid waste or water consumption related to the operation of buildings and infrastructure – would be eliminated. The only necessary energy resource enabling the functioning of a metaversity would be electrical energy required to power server infrastructure and end-user devices.

It should, however, be noted that this aspect also requires deeper reflection. The growing demand for computing power generated by advanced virtual environments, server facilities, and network infrastructure produces its own, non-negligible carbon footprint. A full environmental assessment of a metaversity should therefore take into account not only the eliminated sources of emissions, but also those generated on the side of digital infrastructure, so that the environmental balance of this educational model can be assessed in a reliable and comprehensive manner.

2.5.

When designing a properly functioning university of the future, the issue of educational quality must be taken into primary consideration. The mere fact that a university would operate in a virtual environment cannot negatively affect the quality of services provided; on the contrary, it must ensure a high standard of education, as without this such a form of education will not become widespread. Designers of remote learning systems may also incorporate various motivational mechanisms known from computer games, such as bonuses, tokens, or levels of advancement, which could support student engagement and even partially perform a motivational function similar to that of a teacher.

The virtual environment also creates unique opportunities in the area of learning outcomes assessment, as exemplified by innovative teaching tools offered in digital form. For instance, Professor José Luis Zamora Manzano

presented a tool used in his classes on Roman law. It involves conducting a final or midterm examination in the form of a digital escape room, from which the student can exit only after providing a series of correct, substantive answers [Zamora Manzano 2021]. This immersive form of assessment not only reduces exam-related stress but also verifies the ability to practically and logically apply acquired knowledge in a dynamic 3D environment.

2.6.

Despite the numerous seemingly advantageous features of virtual universities operating in the metaverse environment, a reliable analysis of this educational model also requires consideration of its potential problems and negative aspects. This allows for their early anticipation, prevention, or at least minimisation of their adverse impact on the educational process. One of the most serious and widely documented problems of remote education in general is the reduction of participants' sense of belonging to the academic community. This issue has been repeatedly raised in academic literature and public debate in the context of the mass transition to remote learning during the COVID-19 pandemic, which provided unprecedented empirical material for observing the effects of educational isolation.

The deficit of a sense of belonging – understood as the subjective experience of being an integral part of a learning community – may affect not only students' motivation and engagement, but also their psychological well-being and long-term academic outcomes. As indicated by research conducted, among others, by Romanian scholars, the lack of direct peer relationships, the intensification of anxiety, the limitation of personal development, and complete dependence on the institution's efficiency in organising remote education significantly reduce student well-being [Butnaru, Haller, Dragolea, et al. 2021]. Therefore, when designing a properly functioning metaversity, measures stimulating engagement should be taken into account. An appropriate direction in this regard may be the use of properly integrated social media, which – although operating in a virtual sphere – are capable of uniting and engaging participants in the educational process.

2.7.

Another risk associated with the lack of physical contact may be limited access to psychological care and support, which is a consequence of feelings of isolation and the unmet need for belonging among student users [Aisha and Ratra 2022, 245]. Remote contact cannot replace interaction with a living person, and individuals in psychological crisis may be unable to participate in remote education.

2.8.

In virtual reality, a university will not be able to provide certain non-teaching services, such as sports and recreational development or the support of personal interests. Students will thus be deprived of access to part of the intangible benefits offered by traditional institutions. Only financial benefits will remain available. Moreover, the lack of physical activity and sport – which is a mandatory component of some study programmes – is not assessed positively.

2.9.

A frequently marginalised and underestimated issue may concern digital competencies and digital exclusion. First of all, financial conditions must be considered: when discussing the functioning of virtual universities, they are not limited to developed or developing countries, but also extend to third-world countries, where potential users may not have access to such educational offerings. Furthermore, even within our own society, many individuals may experience financial difficulties that prevent full participation in virtual universities. There is also a significant group of people who lack sufficient digital competencies to fully engage in virtual education without the need for visits to dean's offices, additional inquiries, or direct contact.

The author of the article would also like to draw attention to individuals who are digitally excluded by choice, and thus consciously refrain from being online. An increasing number of people are opting out of internet use, valuing face-to-face meetings and real contact with other human beings.

In conclusion, it cannot be stated that the above-mentioned observations and problems determine that metaverse universities are not a good direction for development, as the digital transformation of higher education is inevitable. However, these issues must be taken into account when designing a fully accessible, inclusive, and functional metaversity.

3. TRANSFORMATION TOWARDS A METAVERSITY: NECESSARY STEPS AND ACTIONS

The implementation of a metaversity in a virtual environment is often superficially equated solely with the deployment of advanced technological infrastructure and highly functional application-based solutions. However, the success of the digital transformation process requires, above all, a comprehensive analysis of the multidimensional needs of stakeholders, including university authorities, supervisory bodies, academic teaching and research staff, administrative personnel, and students, as well as a broad

group of beneficiaries of complementary services, such as lifelong learning and certified short-term courses.

An important component of the implementation strategy is also cooperation with the business sector. This relationship should be based on a model of mutual benefit, integrating financing mechanisms provided by external entities with active knowledge and innovation transfer to the socio-economic environment. The inclusion of this aspect is particularly important in the context of the general mission of higher education institutions, as well as the evaluation indicators of educational quality, which – according to European trends and national legal regulations – place increasing emphasis on the social usefulness of academic output.

The concept of metaversities is consistent with the mission of the Polish higher education system, as defined in Article 2 of the Act of 20 July 2018 – Law on Higher Education and Science.[1] This provision imposes on universities the obligation to actively participate in social development and to stimulate the growth of a knowledge- and innovation-based economy. The implementation of such advanced virtual systems constitutes a significant process and technological innovation, capable of acting as a catalyst for the development of the national digital economy. In accordance with Article 11(3) of the cited Act, the key task of universities remains the transfer of knowledge and technology to the economic sector. In this context, metaversities should serve as platforms where the outcomes of teaching and research activities are effectively commercialised or adapted to the needs of economic practice.

Particular potential in this regard is demonstrated by vocational higher education institutions, whose role – despite its statutory grounding in Article 15 as entities oriented towards contributing to the socio-economic environment – is often marginalised in current discourse. The use of the metaverse by these institutions could revitalise their mission, enabling a more precise response to the dynamically evolving needs of the labour market.

It should, however, be emphasized that under the current legal framework in force in the Republic of Poland, the full implementation of distance learning (100% online) is legally inadmissible. These limitations stem directly from Article 67(4) of the aforementioned Act. This provision obliges universities to ensure infrastructure and software that guarantee interaction – both synchronous and asynchronous – between students and teaching staff. Accordingly, the legislator excludes the possibility of conducting teaching based exclusively on the provision of educational materials (the so-called passive asynchronous model).

[1] Journal of Laws of 2024, item 1571.

In the context of the discourse on the "university of the future," attention should also be drawn to the semantics of the term "persons conducting classes." The use of this expression by the legislator constitutes a specific legislative barrier that excludes the possibility of fully replacing academic staff with artificial intelligence algorithms, avatars, or other autonomous systems, thereby defining the personal nature of the teaching relationship.

Detailed issues concerning the delivery of classes using distance learning methods and techniques have been regulated in para. 13 of the Regulation on Studies.[2] This provision specifies the permissible limit of ECTS credits that may be obtained through distance learning, thereby setting the maximum extent to which this form of instruction may be included in the overall study programme.

Subsequently, the conditions under which distance learning may be conducted have been indirectly defined in the Programme Evaluation Standards of the Polish Accreditation Committee.[3] First and foremost, the tools used should ensure the ability to verify the student's identity. Teaching staff must possess adequate pedagogical and digital competences enabling the proper delivery of classes conducted using distance learning methods and techniques. The delivery of such classes should be included in the teaching workload of academic staff, i.e. in the so-called teaching load (pensum).

Moreover, the university should possess adequate IT infrastructure, technically well-equipped facilities, as well as teaching resources enabling the proper implementation of the educational process. This infrastructure must comply with accessibility standards for persons with special educational needs. Students should be provided with teaching materials developed in electronic form, also accessible to persons with disabilities.

Students should be appropriately trained or otherwise supported in the effective use of the infrastructure and software employed in education delivered using distance learning methods and techniques.

CONCLUSIONS

Although the concept of universities fully integrated into the metaverse constitutes an important element of the future of higher education, its full implementation requires a range of systemic changes. The author does not, however, subscribe to the view that virtual solutions will completely replace universities based on physical interaction with lecturers and fellow

[2] Regulation of the Minister of Science and Higher Education of 27 September 2018 on studies, *Journal of Laws of* 2023, item 2787.

[3] See https://pka.edu.pl/wp-content/uploads/2025/09/OP_wskazniki_spelnienia-standardow_2025.pdf [accessed: 07.06.2026].

students. This hypothesis is supported by the characteristics of Generations Alpha and Beta, which function simultaneously in both physical and digital environments, naturally leading to participation in educational processes through networked technologies. On the other hand, the growing awareness of their own needs among these generations may result in the conscious choice of "offline" activities. Such a preference may reflect a concern for psychophysical well-being and constitute a form of resistance to excessive exposure to virtual environments.

Attention should be drawn to the significant geographical variation in the implementation of assumptions and pilot programmes of universities operating in the metaverse. As indicated earlier, fully operational academic units in virtual reality – designed entirely on the basis of online education, using adaptive artificial intelligence systems, virtual lecture halls, and integrated campuses – are currently being tested mainly in Asian countries (including China, Jordan, and Saudi Arabia). Against this background, Europe shows a clear delay in the adoption of such solutions. A significant barrier is also posed by legal regulations; in the Polish higher education system, conducting studies entirely in a remote form ("using distance learning methods and techniques") is not permitted. Although in some European countries there are universities providing distance education, they operate under separate, dedicated legal frameworks, such as the United Kingdom's The Open University established under a separate Royal Charter in 1969[4] or FernUniversität in Hagen in Germany[5] or Universidad Nacional de Educación a Distancia (UNED) in Spain.[6] However, these are rather exceptions to the general rule of classroom-based education. Therefore, in order to introduce virtual universities in Poland, it would first be necessary to establish legal regulations governing this issue, beginning with the creation of a new legal category of universities or distance education institutions.

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