

Inclusive Competences as a Natural Development Pattern of the University 4.0 Model in the Post-analog Age of Education

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Abstract: Digitalisation of society, significant changes in technology and transformation of labour markets are leading to a change in the educational paradigm. The familiar University 3.0 model is being replaced by the University 4.0 model, which further depersonalises learners while deepening their professional personification. Existing papers on the competence-based model called University 4.0 identify four types of competences needed to train a skilled professional of the future: these are hard skills, soft skills, self skills, and systems thinking. However, the peculiarity of digital reality with its “immaterial digital profile” of an individual is not compensated in any way by the development of ethical skills, especially inclusive ones. People with mental or physical disabilities account for about 10% of the world’s population and about 8% of the Russian population. Without the development of social and professional communication skills, professionals of the future provoke the development of significant discrimination in the labour market of the post-analog era. These arguments were the starting point for the research, the results of which are presented in this article, and the formation of the authors’ competence-based University 4.0 model, which encompasses inclusive competences as universal competences. We give the authors’ interpretation of the definition of “inclusive competence”, which is based on the principle of harmonisation of the future society and assumes that the area of inclusive competences of all learners in educational institutions should be expanded.

1 INTRODUCTION


From the time of the first Platonic Academy (386 BC) until the beginning of the 20th century, the entire history of university education was based on the principle of interactive communication between a teacher and a student. The main type of competence taught was professional, nowadays called hard skills, and this was quite understandable. The length of the Kondratieff technological wave was about 50 years. This was well within the period of one generation’s active working life.


The Humboldt University of Berlin was established at the beginning of the 19th century, when the traditional paradigm of university education was supplemented by research work involving more advanced communication soft skills.

A century later, by the beginning of the 20th century, the Kondratieff wavelength shortened

considerably to an average of 25-30 years, which implied several cycles of learning during working life. The catalogue of educational programmes also changed, with adult education programmes gaining ground alongside basic education. In turn, this also created a demand for fee-based education programmes in new promising professions, the outlines of which began to emerge with the convergence of the university and business communities. Small innovative enterprises at universities such as start-ups and spin-offs were actively developing. This actualised the introduction of modules that develop entrepreneurial skills in the educational programmes. These were the main trends in analog education.

The post-analog or digital age of university development expands the range of competences required by specialists of the 21st century,

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introducing digital competences into the orbit of central competences.

The digital age divides people significantly when face-to-face communication is replaced by virtual communication and, going out in real life, Generation Z often has a very dim view of people with disabilities. That is why, in our view, inclusive competences should also be introduced into modern educational programmes. This, in our view, is crucial, because after Generation Z, who were raised in the post-analog age, generations of the digital age will come. They will grow with innate technological literacy, but with an even more idealised paradigm of perception of life.

2 RESEARCH METHODOLOGY

The hypothesis of our research was the idea that the competence-based paradigm should be expanded in the post-analog age of education towards its digitalisation and humanisation. The rationale for this approach was very clearly outlined by contemporary philosopher Maria Manikovskaya. She sees digitalisation as “one of the tests for the ontological embeddedness of morality and ethics in society” and points to “the increasing distance between the obvious (digital reality) and adequate reasoning” (Manikovskaya, 2019). The same scholar insists that digital reality shifts the focus from a live perception of the other person to a “disembodied digital profile” without empathy, ethics or morality. Contemporary scholars agree that digital reality deforms personal identity, identifies others as a digital profile and leads to a possible dehumanisation of society.

We are aware of a large number of works on updating educational programmes and developing digital competences (Rodríguez-García, 2018), (Tomyuk, 2019), (Brash and Pfeil, 2007), (Lapteva, Projoga, and Pakhmutova, 2019), however, we did not encounter works on implementing inclusive competences as cross-cutting for new professionals of the digital age.

There are highly specialised programmes for training professionals to accompany persons with disabilities in adapting to real life and working life, but we are not aware of considering inclusion as a naturally developed competence for all graduates, regardless of their professional field.

As a methodological framework, we used literature review and sociological research methods in the form of interviews with employers, learners and representatives of the university community.

3 RESULTS OF THE STUDY

3.1 Digital Competence

The concept of digital literacy was initially introduced in 1997 by Paul Gilster as “the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers” (Gilster, 1997).

Paul Gilster highlighted the following skills as criteria for achieving digital competence:

- Media competence which means the ability to perceive information expressed in different semiotic systems;
- Information competence which means skills required to find the information you need and tools to work with it as well as the ability to learn these tools quickly;
- Communication competence which means communication skills with other users.

Ten years later, Allan Martin and Dan Madigan extended this definition to the following form: “digital competence is the awareness, attitude and ability of individuals to appropriately use digital tools and media to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, to build new knowledge systems, and to communicate with others” (Martin and Madigan, 2007).

The work of Professor Soldatova stands out among the works of Russian scholars, who understands digital competence as “an individual’s ability to confidently, effectively, critically and safely choose and apply information and communication technologies in different areas of life (information environment, communication, consumption, technosphere), based on the continuous acquisition of competencies (knowledge, skills, motivation, responsibility), as well as their readiness for such activities” (Soldatova, 2015). This scholar identifies four types of digital skills:

- Media competence which means knowledge, skills, motivation and responsibility associated with seeking, understanding, organising and critically reflecting on digital information, and creating information objects using digital resources (text, image, audio and video);
- Communication competence which means knowledge, skills, motivation and responsibility required for different forms of communication (email, chat rooms, blogs, forums, social media, etc.) and with different purposes;
- Technical competence which means knowledge, skills, motivation and

responsibility to use technical and software tools effectively for various tasks, including the use of computer networks, cloud services, etc.;

- Consumer competence which means knowledge, skills, motivation and responsibility to solve various daily tasks related to specific life situations involving different needs using digital devices and the Internet.

When applying the skills of digital competences laid down by Gilster almost 25 years ago and skills outlined in Soldatova's work, one is struck by consumer competence, which repeatedly actualises the total penetration of digital competences into everyday life.

The importance of the consumer competence increased manifold during the 2020 lockdown caused by the COVID-19 pandemic, when people were forced to become users of developed digital solutions overnight in order to solve current daily problems.

The following digital literacy skills were highlighted at the 2017 G-20 Summit:

- Information literacy;
- Computer literacy;
- Communication literacy;
- Media literacy;
- Attitude towards technology or innovation.

It is the fifth skill that shapes digital competence (attitude towards technology and innovation) and demonstrates the relevance of the need to constantly compensate for the "digital gap" arising in a situation of progressive information technology and device development and the group resistance to change existing in society among generations X and Y.

Our hypothesis is that skills of process architecture design should be highlighted within digital competences. By these skills we mean an awareness of the essence of the system and its key properties which determine its behaviour, composition and evolution and which influence the appropriateness, usefulness and manageability of the system. The design skills in this case will provide the flexibility to modify key properties of the process to achieve specified parameters.

These skills will be particularly important for training engineers, as elementary programming skills have been named as embedded soft skills in the Atlas of New Professions.

3.2. Inclusive Competence

According to statistics, about 11.8 million people of all disability groups are registered in Russia in 2020 (about 8% of the Russian population), which

significantly highlights the problem of professional socialisation of this group of people. The problems of people with disabilities have always been a focus of the state, but there are persistent social patterns of exclusion from barrier-free entry into the labour market. In an age of total digitalisation, these groups have every chance of becoming members of the precariat class. The higher education system must therefore pioneer the trend for establishing self-learning socially oriented companies, created by the cooperation of social and functional insourcing in the implementation of training in accordance with the latest digital trends. And for that, Generation Z and their descendants need to have sustainable inclusive competences.

When analysing existing educational and professional standards, we found that there is almost no training for students in inclusive competences.

Inclusive competences are found exclusively in the educational standards for training specialists in the field of medicine and education. All other training areas do not ensure that the majority of graduates are prepared to meet people with disabilities in their everyday and working lives.

Ilmira Khafizullina gives the following definition of inclusive competence. "Inclusive competence is an integrative personal formation that determines the ability to perform professional functions in the process of inclusive education, taking into account different educational needs of students and ensuring the inclusion of children with disabilities in the environment of a general education institution, creating conditions for their development and self-development".

"Inclusive competence includes a set of interrelated components, such as motivational, cognitive, operational and reflective components" (Khafizullina, 2008). Natalya Korneeva defines this concept as "the ability to perform professional functions, ensuring the inclusion of people with disabilities in the environment of a professional institution, creating conditions for their development and self-development". (Korneeva, 2011).

Inclusive competence includes the following skills:

- Cognition which means perception and awareness of inclusive education as an object of attitude, its conceptual idea, essence, the factors determining its effectiveness;
- Communicativeness which means the ability to organise interaction and communication with those involved in inclusive educational settings, and to find and master appropriate means and techniques of communication;

- Reflexivity which means analysis of the effectiveness of the communication process when working with people with disabilities.

According to the research carried out by scholars Romanovskaya and Khafizullina, even experienced educators' level of inclusive competence was almost equal to zero. However, after taking the competence development programme "Inclusive Competence for General Academic School Teachers", there was an increase in skills above the average level (Romanovskaya and Khafizullina, 2014).

Table 1: Inclusive competence of educators, %

Demonstration of residual skills			Demonstration of developed skills		
zero and low	medium	high	zero and low	medium	high
97.5	2.5	0	5	55	40

Based on the results of this study, it can be concluded that even if trained inclusion educators show a pronounced tendency towards skill obsolescence, those not trained to work and communicate with such professionals of the future will simply ignore them in their social and working lives.

In the current context, we consider it necessary to extend the reach of inclusive competences to all learners in educational institutions. Fostering tolerance and empathy with all members of society can counteract to some extent the syndrome of the "digital disembodied profile" of a modern human.

It will also reduce social tensions in society, where potential employers and colleagues view people with disabilities as some kind of burden, often because they do not have a coherent understanding of existing disabilities and the mechanisms available to communicate with them.

To test our hypothesis, a sociological survey of employers, students and representatives of the university community from the cities of Astrakhan, Tambov, Saratov, Maikop, Nalchik, Moscow, Atyrau (Republic of Kazakhstan) and Baku (Republic of Azerbaijan) was conducted, the results of which are shown in Table 2.

In the survey, we asked the interviewers two questions:

- Should the set of digital competences be extended with the skill of process architecture design;

- Should inclusive competences be introduced into existing learning standards as universal competences.

Table 2: Results of a sociological survey of employers, learners and representatives of the university community on the inclusion of digital and inclusive competences in the list of mandatory competences for professionals of the future

Digital competences			Inclusive competences		
1	2	3	1	2	3
87	5	8	93	2	5

where, 1 is should be included; 2 is should not be included; 3 is difficult to answer

As the results of the sociological survey show, almost 90% of respondents said it was important and timely to expand the competence-based paradigm in the post-analog age of education in the direction of its digitalisation and humanisation.

3.3 Discussion of the Results

The transformation of education in the post-analog age must meet the requirements of the University 4.0 concept, according to which universities will be the driving force behind the use of all digital tools to flexibly change communication between the main actors of the educational process. University 4.0 aims to provide not only knowledge, but also a new paradigm of thinking that involves fine-tuning the demands of learners and the educational organisation to the requirements of the labour market.

At the strategic session on the formation of the Big University in Tomsk in 2019, the University 4.0 model was presented, which substantiated that the use of digital tools (artificial intelligence, data analysis, big data management) allows synchronizing educational programmes and demands of employers who act as customers, promptly presenting adaptive learning and individualization of educational trajectories (Fadeev, Zmeev, and Gazizov, 2020).

The same authors define qualified graduates as having the following competences:

- Hard skills (professional skills and abilities, applied knowledge);
- Soft skills (soft skills, communication skills);
- Self skills (development of personal qualities);
- Systems thinking.

It should be noted that the University 4.0 model does not consider humanisation of education. Therefore, it seems necessary to complement the model presented above with inclusive skills.

We define inclusive competence as “an individual’s ability to carry out social and professional functions in a harmonious way when interacting with persons with disabilities, taking maximum account of their physical and psychological development, not discriminating against them and creating comfortable conditions for their adaptation at work and subsequent self-development”.

Based on our reasoning, we propose the following University 4.0 competence model.

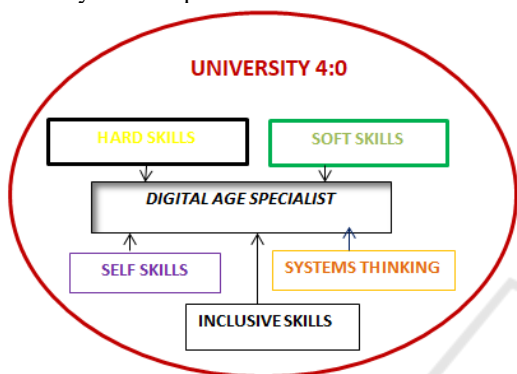


Figure 1: University 4.0 competence model

Within the framework of our proposed addition to the existing competence model, the digital and ethical development of modern society will be harmonised.

4 CONCLUSIONS

The digitalisation of society and education system as well as the emerging profile of a professional of the future reveal personalised skills of working and interacting in a team with people who are not physically or psychologically disabled. Meanwhile, the problem of socialisation of persons with physical and psychological disabilities, given the significant transformation of the labour market and the extinction of their traditional professions, makes it urgent to develop new educational programmes that shape inclusive competences of Generation Z graduates and their descendants to prevent social and professional discrimination.

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