Part D
Final Act: Summary and Epilogue

The word epilogue comes from the Greek word *epilogos*, which means "conclusion word". It always comes at the end of a work and is therefore the opposite of a prologue, which always comes at the beginning. As with the prologue, the epilogue originated with Greek playwrights and poets. It served both as a summary of the play's moral lessons, as well as a wrap up of the characters' fates. In that sense and in a manner of summarising we can clearly state that research on *Future Skills* is currently the hot topic of the day coming along with fundamental changes in the job market and in our lives in general due to a number of powerful drivers and developments.

The present publication is the first comprehensive book publication about the emerging issue of *Future Skills*.

While many studies focus on the changes brought through digital technologies, they relate *Future Skills* directly to digital skills, which – as important as they are – only represent one side of the *Future Skill* coin. The results presented from the *NextSkills* Studies are taking a broader approach and go far beyond digital skill demands. The approach elaborates on an experts' informed vision of future higher education, describes in detail 17 *Future Skills* profiles, outlines the four pillars of change which will shape the learning revolution in higher education and – through the *Triple Helix-Model* – presents a first model of *Future Skills* for future graduates. Being part of an overarching research initiative on "*NextSkills*" (www.nextskills. org) it collates opinions from many sources and original empirical research set in

the interface between higher education and business. Participating experts were asked on the nature, the relevance, as well as the timeframe of adoption for *Future Skills*, future higher education scenarios and the driving pillars of change.

What plays out in the future depends on decisions taken today, which can critically narrow the room for manoeuvre over time. That is why it is important to factoring the long term into decision-making in higher education today. Starting point for research on *Future Skills* is an analysis of factors, which influence our lives, the way we work and live, learn and develop. On the one hand, we cannot predict what the future will look like, whereas, on the other hand we notice that changes are underway and leave us with a changed environment demanding different behaviour, and adaption to more complex situations in our live and work contexts. An analysis of such changing factors is available in a multitude of volumes, in many forms, shapes and perspectives. The nature of such descriptions, studies and analyses is – as they are dealing with the future – naturally carrying a certain degree of vagueness, while being as precise as possible in order to capture aspects, which can be taken as factors of influence for the future: future ways of living, future ways of working, future ways of learning, etc. (e.g. OECD 2019, 2018, 2017a, 2017b). Analysing the currently existing writings dealing with the question of which skills and abilities will be important for the future work life, at least two converging primary factors crystallise:

- Ever faster technological advancements and their penetration and infusion of all spheres of our lives, work and societies, leading to an excess of information and options. This can be compared to the point in time, when Gutenberg invented the printing machine for books, and for which our society is only starting to develop ways of coping with it.
- Increased global cooperation, exchange, and communication, which moves from being an option to being a necessary ingredient of every process of society, work and individual life.

Resulting from that, a number of connected changes can be observed, which we believe to be secondary effects, building on the foundations of the two prior ones:

- Resulting from the tectonic shifts in the structure of work and its development, a new demand for (higher) education study and learning pathways and qualification structures including certification and credentialing schemes will be needed. Educational institutions need to understand these forces in order to develop a changed vision of future education to inform their strategies.

- Fostered through these changes an ever-larger demand for higher educational attainment is induced evoking industrialised societies to turn into learning/educational societies in which life risks primarily can be mitigated through education.
- And lastly, a changing nature of the very essence of what learning (in school) and studying (in higher education) is aiming at can be observed, leading to a new 'lead-orientation' for concepts like knowledge – shifting from static knowing to knowing & reflection in action in complex and open situations.

It is important to note that no cause-effect model can be applied to these developments. In order to find reference models which are capable of capturing the intertwined and networked nature of these developments with factors mutually influencing each other, we turned to eco-systems theory and cybernetics. The dynamic nature of these approaches able to deal with and describe system dependencies provides grounds for theoretical description of reality. The eco-systemic approach is based on the assumption that changes and developments in one system are causing effects in a connected system. Building on this approach, combining it with an education science point of view, as well as with a sociological perspective, our research shows that there are ongoing changes within the structure, nature, and profile of the abilities and skills. Individuals will need these skills for their professional and personal lives in order to cope with the demands and requirements of their respective work contexts and tasks, and society will need them to stand up to the challenges it is facing. In our research we found, that these changing skill requirements can be described and analysed.

Notably, policy and especially research, pays increasing attention to analysing in-depth changes and trends for the future world of work and for future job markets (see chapter B 1 State of Research – Old Bottle, New Wine?) However, most approaches fall short of two perspectives, which we call the "iceberg phenomenon" and the "future education gap":

- The first blind spot is the *iceberg phenomenon*: The iceberg phenomenon of *Future Skill* research refers to the fact that *Future Skill* research is often focusing on technological change (World Economic Forum 2018, Hirsch-Kreinsen 2016, CEDEFOP 2012, Deloitte 2018, PwC 2018, McKinsey & Company 2018, Balliester & Adam 2018), which is only one side of the coin. Our research shows that this is just the tip of the iceberg. Only very few studies try to elicit the changes, which go along with it and which lie underneath the surface of said iceberg: dealing with future work concepts, the tectonic shifts throughout an entire business or public organisation, the way collaboration is organised, and the impact it has on

organisation culture, new leadership concepts, more decentralised, smaller units, and a need to organise shared creativity and shared cognition in a global setting.

- The second blind spot is the *Future Skills* education concepts gap, which refers to a lack of research with regards to the demand and shape of future higher education concepts, which meet the need for *Future Skills*. It is still unknown how higher education institutions can organise their academic programs in a way that they specifically are sensitive to supporting the development of *Future Skills* for their future graduates. Although many promising attempts and pilot trials are underway, there is no overarching forum for discussing possible future higher education and its institutions.

Both issues, the iceberg phenomenon of *Future Skill* research and the future education gap are predominant issues in *Future Skill* research today. It was exactly with this intention to overcome this shortfall that we designed a threefold long-term research project, starting in 2015, and called it "*Future Skills* – Future Learning and Future Higher Education" in order to be able to research the articulation, extent, nature and contexts of *Future Skill* – not limited to digital skills but *Future Skills* with a broader scope.[57] The research focus from the beginning was on identifying *Future Skills* in a broad and holistic sense, incorporating digital skills but going beyond them, and determining which changes are caused in work environments leading to these new skill demands. Moreover, we asked how higher education institutions would have to reorganise their academic programs in order to support development of such *Future Skills* for future graduates.

There are complex feedback loops between new technologies, job creation, education organisations' attempts to prepare individuals for present and future jobs, and their skill development. New technologies can drive business growth, job creation, and demand for specialist skills, but they can also displace previously existing roles when certain tasks become obsolete or automated. Well-developed links between higher education institutions and labour markets in order to share and exchange information about these often short-term developments, do not exist at large scale.[58] Skill gaps – both, among workers and among the leadership of organisations – can speed up the trends towards automation in some cases but

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57 Notably the first European country, which had a national higher education strategy mentioning the term "*Future Skills*" was Ireland (http://hea.ie/assets/uploads/2017/06/National-Strategy-for-Higher-Education-2030.pdf).

58 Good practices for frameworks of university business cooperation have been analyzed in the frame of the HAPHE Project (http://haphe.eurashe.eu)

can also pose barriers to the adoption of new technologies and therefore impede business growth.

Starting from the current lack of agreement on how higher education will develop in shape, nature and organisation in the future in order to meet the demands of tomorrow's future workplace and society, the *NextSkills* Studies seeks to state clearly which drivers of change in higher education will become relevant in the near and further future, how higher education institutions will develop driven through these "pillars of change", and gain clarity on the description of *Future Skills* and their nature. The intense interaction with national and international experts, stakeholders of the higher education governance community as well as private businesses and students who participated in different parts of the studies made clear that there is no unanimous consensus – and as research team we neither expected this, nor did we think that it should be possible. However, the research results show clearly that – whichever scenario for higher education institutions` development one focusses at – a radical advance will have to be made in order to arrive from the current situation of todays' higher education at the position of each respective scenario. We can draw the following conclusions.

With regards to *Future Skills* we can conclude:

1. *Future Skills* can be analysed and described as a set of profiles, each containing an array of skill definitions covering *Future Skill* demands.
2. These skills can be referred to as *Future Skills* and can generally be described through two cornerstone characteristics: a strong, transversal and well-developed ability of self-organisation, which is mutually supported through a high-articulated supposition to act under conditions of uncertainty. Proficiency in any field in the future will entail these two traits.
3. *Future Skills* can be described within a model, which is structured into three dimensions: a subjective – individual development-related, an objective – task and subject matter-oriented, and a social dimension – organisational and environment-related. All three dimensions interact with each other and are not sole expressions of isolated skill domains: subjective aspects influence the outlook on objective aspects, as well as social aspects impact subjective and objective aspects.
4. The *Future Skills* approach presented here is going beyond a static model of listing a set of defined skills. It is going beyond digital or technical skills which will – no doubt – carry high importance for the future workforce but represent just one ingredient. The specific value of the presented *Future Skills* approach lies within the combination of focusing on the development of dispositions

to act in a self-organised manner in the respectively described domain with a defined array of skills.

5. The first *Future Skills* dimension is the subjective dimension of *Future Skill* profiles. It is relating to an individual's subjective, personal abilities to learn, adapt and develop in order to improve his/ her opportunities to productively participating in the workforce of tomorrow, actively shaping the future work environment, and involve him-/herself into forming societies to cope with future challenges. It contains seven *Future Skill* profiles.

6. The second *Future Skills* dimension relates to an individual's ability to act in a self-organised manner in relation to an object, a task or a certain subject matter-related issue. It emphasises a new approach, which is rooted in the current understanding of knowledge but is suggesting taking knowledge several steps up the ladder, connect it to motivation, values and purpose and impregnate it with the disposition to act in a self-organised fashion within the knowledge domain in question. It is not just a quest for more knowledge but for dealing with knowledge in a different way, which is resulting into professionalism and not merely into knowledge expertise. This dimension houses five *Future Skills* profiles.

7. The third *Future Skills* dimension is relating to an individual's ability to act in a self-organised way in relation to his/ her social and organisational environment, as well as to the society. It emphasises the individual's dual role as the curator of his/ her social portfolio of membership in several organisational spheres while at the same time taking over the role of rethinking organisational spaces and creating organisational structures anew to make them future-proof. It contains an array of four skill profiles.

With relation to future learning we can conclude:

1. Higher education institutions in the future will need to provide a learning experience which is fundamentally different from today's model. Adoption timeframes vary, but the *NextSkills* Studies conclude short or mid-term timeframe for many aspects.

2. The dimensions of future learning in higher education will comprise structural aspects, as well as pedagogical aspects related to learning design. Structural aspects comprise academic learning as episodical process between biographical phases, professional and private episodes throughout life, learning as institutional patchwork instead of the current one-institution-model and supported through more elaborated credit transfer structures, micro-qualifications and microcredentials. Pedagogical aspects related to learning design of academic learning comprise changing practices of assessment, also peer-validation, learning

communities, focus on *Future Skills* with knowledge playing an enabling role for learning in interactive socio-constructive learning environments.

3. In general, we estimate structural changes to become relevant much later than changes related to academic learning design.

Concerning the future of higher education, we can conclude:

1. Four key drivers in the higher education market can be described. Each driver has a radical change potential for higher education institutions, and together they mutually influence each other and span the room in which higher education will likely develop.
2. There are two content and curriculum related drivers (i.e. (1) personalised higher education, and (2) *Future Skill* focus), and two organisation-structure-related drivers (i.e. (1) multi-institutional study pathways, (2) Lifelong Higher Education).
3. The profile, shape and nature of higher education in the future will be most probably a certain pattern of configuration along the impact that each of the four key drivers – called "pillars of change" – has and will influence the development of higher education strategies.
4. Our studies looked from a student's perspective and envisioned future learning experiences. Four scenarios for future higher education can be described as gravitation centres of organisational development: (1) the *Future Skill* university scenario, (2) the networked multi-institutional study scenario, (3) the MyUniversity scenario, (4) the Lifelong Higher Learning scenario.
5. The experts estimated that the adoption time for three out of four scenarios would be a bit more than ten years from today. Only the lifelong higher learning scenario was suggested to become relevant already within the next five years.

In a famous speech Nelson Mandela once expressed that the power of education extends beyond the development of skills we need for economic success. It can contribute to nation-building and reconciliation. To shaping the world, we live in. It is the most powerful tool to change the world.

With these words we wish to close this book, continue the conversation and open the debate!