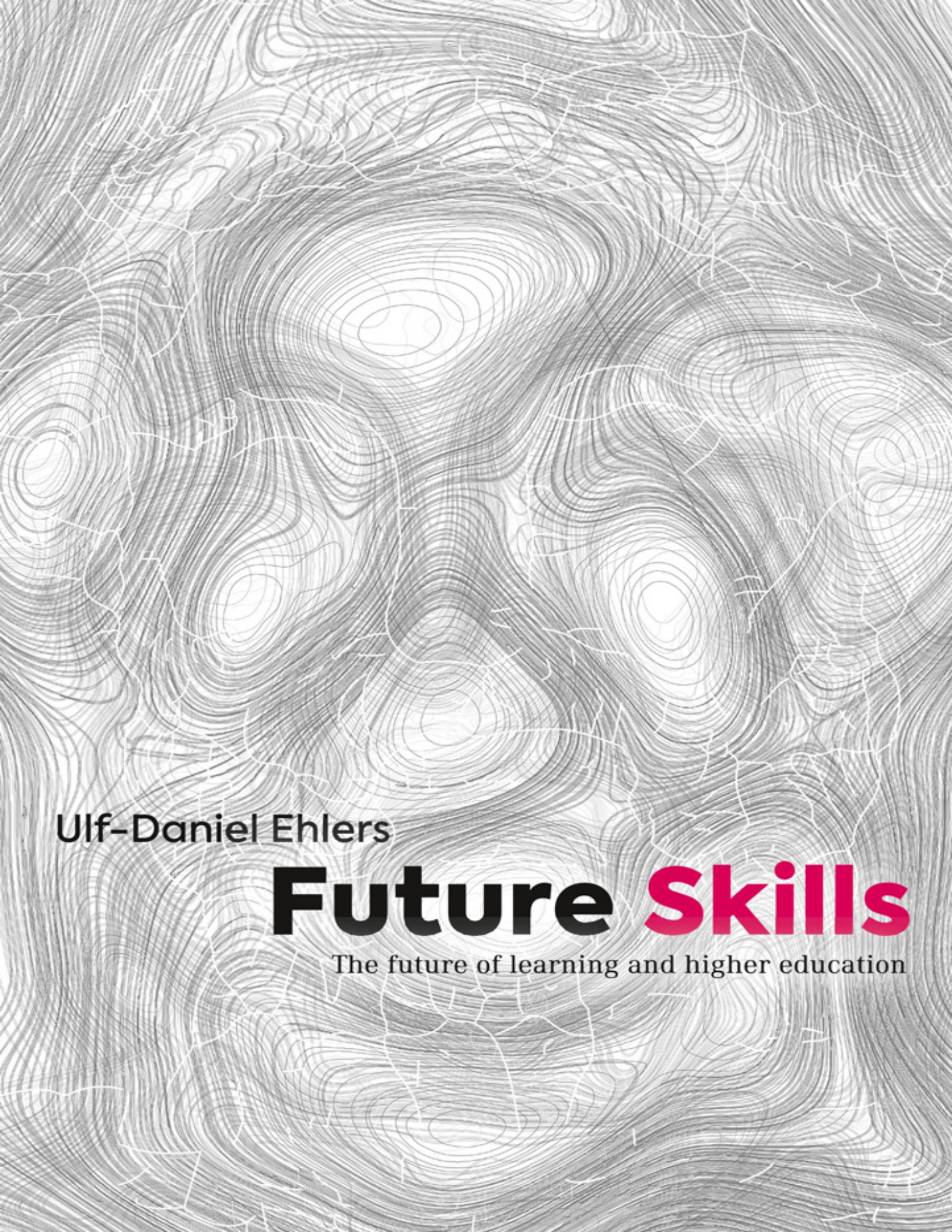




Ulf-Daniel Ehlers

Future Skills

The future of learning and higher education

To all who walked along with me,
and who continue to do so,
with profound gratitude for challenges and inspirations!
And to Joshua and his future...

This book is part of the international Springer Book Series “Future Higher Education - Zukunft der Hochschulbildung”, edited by Prof. Dr. Ulf-Daniel Ehlers (Book Series: ISSN 2662-5768).

About the book series: The book series is focussing on higher education’s dramatic change worldwide. Student enrolment rates of over 70 percent within the next 15 years in industrialized countries and a drastic increase in demand in developing and emerging countries mark a new status and a changed function of higher education in postmodern societies. At the same time, the demands on universities are increasing to prepare their graduates to shape a global and digitalised world of tomorrow. The role that higher education plays in the implementation of the Sustainable Development Goals speaks for itself: without a university of the future that is renewed in terms of content and organisation, it will not be possible to solve social problems such as those associated with climate change, the challenges of migration, which will increase in the future, conflicts that arise as a result of populist social and political concepts and the associated question of the future of democracy. The development of a renewed social consensus on the role of higher education in the future requires the creation of forums and channels in which the question of higher education in the future can be discussed. The “Future of Higher Education” series aims to take up contributions from the whole range of scientific and socio-political topics and thus support the development of viable concepts for the future of higher education.

The topics of the series range from indepth analyses of society, the significance of the science system and higher education system in the society of the future to questions of future higher education management. Empirical studies but

also basic approaches to higher education innovation topics are focused on, including detailed topics such as alternative forms of study, micro certificates, digital transformation, block chain for higher education and other topics.

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Our deepest fear is not that we are inadequate.
Our deepest fear is that we are powerful beyond measure.
It is our light, not our darkness
That most frightens us.

We ask ourselves
Who am I to be brilliant, gorgeous, talented, fabulous?
Actually, who are you *not* to be?
You are a child of God.

Your playing small
Does not serve the world.
There's nothing enlightened about shrinking
So that other people won't feel insecure around you.

We are all meant to shine,
As children do.
We were born to make manifest
The glory of God that is within us.

It's not just in some of us;
It's in everyone.
And as we let our own light shine,
We unconsciously give other people permission to do the
same.
As we're liberated from our own fear,
Our presence automatically liberates others.

(Marianne Williamson)

Preface

Also, each effect demands an equally strong counter-effect, begetting demands equally active receiving. The present must therefore be prepared already for the future.
(Wilhelm von Humboldt, *Ideen über Staatsverfassung*)

I wrote this book to open up a conversation about how the new world of skill demands in a post knowledge era, will look like. And to stimulate an exchange about how higher education might evolve their institutions to better align teaching and learning in the light of these new demands. Writing this book was both easy and hard. Easy, because I have the privilege to be fully immersed into the global community of learning innovators in higher education and also businesses in our own institution and across the entire field of higher education. Hard, because the ideas I am presenting here – that we are entering a post-knowledge era with *Future Skills* on the rise and that higher education institutions will change its shape and appearance – are both nascent and contestable. In the book I try to say some new things – and hopefully some true things – about how higher education is changing.

The book is meant to look ahead, to provoke and to inspire. That is why I chose such a title: *Future Skills* – sounds strange, at least at first sight it does! The title is creating doubts and it annoys. At least from an educational science point of view it is fair to say that dealing with the subject of *Future Skills* is a paradox in itself already. Why? Skills, i.e. abilities and competences, are per se aimed at

mastering future challenges. So why impregnate such a future concept again with the addition “Future”? If you, however, take time and deal with the subject of *Future Skills* more in-depth it quickly becomes clear that there is more at stake. More than just finding a new terminology for the concept of competence.

Future Skills initiatives are currently being developed all over the world in various shapes and forms, many of whom are discussed in detail in this book. Some are sectoral, for schools or universities, others national, e.g. the initiative *Future Skills* Canada or also international, e.g. from the OECD, the EU or the World Economic Forum. All approaches have one thing in common – they all reflect the changed social conditions for work, education and life and analyse important *Future Skills*. Many of these concepts focus on skills for employees in a digitised world. In particular those are focussing on digital data-related skills which originated already in the 1990s and 2000s and were discussed there as digital or information literacy. These approaches are now often enriched with important intercultural communication and cooperation skills.

In other *Future Skills* approaches, the topic appears as a continuation of the concept of lifelong learning, in order to ensure a fit between constantly changing requirements on the one hand side and the capabilities of the individual to cope with them on the other hand side. Often this comes along with a strong focus on an economic impetus of participation of the individual in the labour market, sometimes also coloured differently as Skills for Life. And in fact, it is hard to find approaches that attempt to establish a more holistic educational reference frame within a widened understanding. This brief analysis already shows that there is obviously more at stake than just a renaissance of the concept of competence in a new shape and form. Apparently, there is a need to charge the concept of competence and give it direction. The underlying reason is a

societal change of the magnitude of a tectonic shift alongside with huge pressures on organisations to change their mode of operation, their way of working, and in consequence also asks for a profound change in the higher education sector. It asks the question how *the university* as an institution can master the future and the question as to what the future of higher education looks like.

How difficult the task is to understand this future is expressed in the fact that under conditions of emergent social developments the understanding of the future results less and less from knowing the past; and also in the recognition that our social, political and economic realities more and more are the result of emergent processes – meaning, they develop self-organised cannot be determined in advance and often appear seemingly without a clear trigger. Emergence comes along as a more and more influential phenomenon in all spheres of life. The ability to deal with these ever faster accelerating contexts in the future is following less and less the known and widely practiced paradigm of knowledge acquisition based on ready-made curricula in higher education but requires a radical situative change. The concept of lifelong learning with its various implementations' varieties, the idea of a post knowledge society, competence orientation in education institutions, and the digitally ubiquitous and constantly available information and knowledge are the ingredients which will form the basis to compose new, flexible and connected learning pathways.

The very concept of *Future Skills* asks for fundamental change. It asks for more than a simple list of skills that schools or higher education institutions can use and base their curricula on in order to be able to guarantee their learners a future-proof and secure preparation for all eventualities. *Future Skills* still goes deeper and reaches wider. It calls for change which is so profound that it touches on the foundations of our educational and labour system. In

highly developed organisations in which *Future Skills* play a major role already, work processes are often subject to drastic changes, responsibility structures and patterns of action shift. In higher education the notion of *Future Skills* questions the preparatory proposition according to which students can be prepared through knowledge acquisition for the futures to come.

It is true that the concept of key competences over the last two decades, at least in higher education institutions, has given rise to the idea that, in addition to knowledge transfer, other aspects, precisely those key competences play an important role in preparing for the labour market. In addition, capacity to shape the world we live in, citizenship and competences for life have gained importance. However, the complete integration of a deep competence orientation in the sense of the ability to deal with highly emergent systems, emergent organisations and unknown situations of the future, has so far only been introduced to a limited extent. The emerging discussion about *Future Skills* deals with the question of how this emerging can be done. Adding to this debate is the currently emerging movement of occupationalisation of academic education in an emerging educational society. It is raising the issue how both aspects can be combined – in this this book we argue that both concepts support each other as two sides of the same coin.

This book deals with three topics: Topic 1 is the analysis of the background, the change in organisational structures and the drivers against which the *Future Skills* concept is currently rising. Theme 2 is the appraisal of skills based on various empirical studies, and theme 3 is an elaboration of drivers and scenarios for the university of the future. All three topics are dealt with on basis of empirically validated concepts and follow on from the international discussion that exists in this area and which are being scientifically investigated within this book. This book is therefore not aiming to contribute a finite and finalised list of *Future Skills*

to the current discussion in the field – even though a huge further step has been taken through the work, compared with many existing concepts. Its specific and unique contribution consists of working out the underlying structures of *Future Skills* for higher education.

The book develops a model that describes the underlying structures and processes of change which form the base for the development of *Future Skills* and with its *Triple Helix Model* identifies three basic components that constitute *Future Skills*, as the ability of individuals to act in future highly emerging contexts. The *Triple Helix-Model* of *Future Skills* is able to map the areas that are important for *Future Skills* and has a greater explanatory depth than the simple lists presented so far on this topic in other contexts. “*Future Skills – Future of Learning – Future of Universities*” is the first book on the subject of *Future Skills* and is at the same time the first empirical work on the theme, rooted in educational science. It covers not only the question of *Future Skills* for future work, but also *Future Skills* as a fundamental capacity to act in a changing world.

This is a book about the future. It is inspired through the present and informed by the past. It lives out of the concerns voiced in moments of reflection and all the same out of the hopes that higher education can contribute to a culturally rich, personally rewarding, sustainable, prosperous and happy future for all. For us all but especially for our children.

I would like to thank all those involved who have contributed to making this book a reality. This book benefits from conversations with colleagues from near and far and all over the world. From interviews, discussions and contributions from students, friends, colleagues, scholars and business leaders. My wonderful team which supported the important studies which we implemented, and the translation of the German version. A very special thanks to Patricia Bonaudo, Laura Eigbrecht and Silke Huber and to

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The book represents an important milestone in the question of how we will further develop our higher education institutions in the future. The project goes beyond digitisation, takes up competence orientation in great depth and presents models and profiles for higher education development over the next 15 years.

Karlsruhe, March 2020
Ulf-Daniel Ehlers

Contents

1 *Future Skills* - The Key to Changing Higher Education

2 The *Future Skills* Turn

II.1 Towards a Post-Knowledge Era: The Relativity of Knowledge

II.2 The *Future Skills* Turn

II.3 Conversations with Practitioners: Gaining Insights into the Practice of Supporting *Future Skills* Development

II.3.1 Building a Networked Organisation

II.3.2 The End of Instruction: Learners as Experts

II.3.3 Creativity in Distributed Teams

II.3.4 Flexibilisation and Self-Organisation

II.3.5 Creating Space, Changing Perspective, Enabling Innovation and Creativity

II.3.6 Self-Regulated Learning

II.3.7 Empowering Personal Growth

II.3.8 Making Space to Learn

II.3.9 Participatory Strategy Development

Part A *Future Skills* for the World of Tomorrow

A 1 Objectives & Methodology of the *NextSkills* Studies

A 1.1 Research Objectives

A 1.2 Methodological Framework

A 1.3 Research Design

A 1.3.1 Step 1: Identification of Future Organisations

A 1.3.2 Step 2: Qualitative Interview Study

A 1.3.3 Step 3: International Delphi Study

A 2 The *Future Skills Triple Helix-Model*

A 2.1 The *Future Skills Triple Helix-Model*: Capacity to Act in Emergent Contexts

A 2.2 Shift 1: From Standardisation to Self-Organisation

A 2.3 Shift 2: From Knowledge to Competence

A 2.4 Shift 3: From Hierarchical to Networked Organisations

A 2.5 Summary and Conclusion

A 3 *Future Skills for the World of Tomorrow*

A 3.1 Competence Cluster I: Subject development-related competences

A 3.1.1 *Future Skill* Profile #1: Learning literacy

A 3.1.2 *Future Skill* Profile #2: Self-efficacy

A 3.1.3 *Future Skill* Profile #3: Self-determination

A 3.1.4 *Future Skill* Profile #4: Self-competence

A 3.1.5 *Future Skill* Profile #5: Reflective competence

A 3.1.6 *Future Skill* Profile #6: Decision competence

A 3.1.7 *Future Skill* Profile #7: Initiative and performance competence

A 3.1.8 *Future Skill* Profile #8: Ambiguity competence

A 3.1.9 *Future Skill* Profile #9: Ethical competence

A 3.2 Competence Cluster II: Object-related competences

A 3.2.1 *Future Skill* Profile #10: Design-thinking competence

A 3.2.2 *Future Skill* Profile #11: Innovation competence

A 3.2.3 *Future Skill* Profile #12: Systems competence

A 3.2.4 *Future Skill* Profile #13: Digital literacy

A 3.3 Competence Cluster III: Organisation-related competences

A 3.3.1 *Future Skill* Profile #14: Sensemaking

A 3.3.2 *Future Skill* Profile #15: Future and design competence

A 3.3.3 *Future Skill* Profile #16: Cooperation competence

A 3.3.4 *Future Skill* Profile #17: Communication competence

A 4 Higher Education Readiness for *Future Skills* Adoption

A 4.1 Adoption of Individual Development-Related Competences

A 4.2 Adoption of Individual Object-Related Competences

A 4.3 Adoption of Individual Organisation-Related Competences

Part B *Future Skills*: Research, Theory and Organisational Practice

B 1 State of Research – Old Bottle, New Wine?

B 1.1 Definition and Concept of *Future Skills*

B 1.2 Terminological Environment of the *Future Skills* Concept

B 1.2.1 Education and Learning Theory of *Future Skills*

B 1.2.2 *Future Skills* as Competence

B 1.2.3 Self-Organisation

B 1.3 *Future Skills* Research: Literature Review

B 1.4 Critical Analysis of Existing *Future Skills* Concepts

B 2 Foundations of the *Future Skills* Revolution: The Theory of *Future Skills*

B 2.1 The “Drift to Self-Organisation”

B 2.1.1 Self-Organisation and Structure

B 2.1.2 Self-Organisation as a Social Trend

B 2.1.3 Self-Organisation Strategies in Organisations

B 2.1.4 Self-Organisation and Self-Management

B 2.1.5 Self-Organisation as Management Paradigm

B 2.2 Self-Organisation and Competence in the Post-Knowledge Era

On a Note... Myths and Misunderstandings About Competence in Higher Education

B 2.3 Anchoring *Future Skills* in Educational Theory

B 2.4 Emergence and Self-Organisation

B 2.5 Synergetics and Self-Organisation

B 2.6 Co-Evolution and Self-Organisation

B 2.7 Digitisation and Self-Organisation

B 2.8 Autopoiesis and Self-Organisation

B 2.9 Summary and Conclusion

B 3 The Principles of *Future Skills* Development

B 4 *Future Skills* for Future Organisations: An Analysis

B 4.1 Self-Organisation as a Management Principle

B 4.1.1 Sociocracy in Organisations

B 4.1.2 Holacracy – Agility and Responsibility

B 4.1.3 The Democratic Organisation

B 4.2 State of the Art of Self-Management and Agile Management Practice

B 4.3 Conclusion on Self-Organisation as a Basic Principle

Part C Future of Higher Education – Higher Education of the Future

C 1 Ten Seconds of the Future of Higher Education

C 1.1 First Second: Digitisation – Higher Education in a Digital World

C 1.1.1 Accelerated Innovation Cycles – Change as the New Normal

C 1.1.2 Reversing Innovation

C 1.1.3 Digital or Traditional: What's Better for Education?

C 1.1.4 Open Education: A New Digital Openness

C 1.1.5 The Race Between Technology and Education

C 1.2 Second Second: Higher Education in a Transformative Society

C 1.3 Third Second: Demographic Change

C 1.4 Fourth Second: Flexibilisation of Work and Education

C 1.5 Fifth Second: Open Education & the Shared Knowledge Economy

- C 1.6 Sixth Second: In-Loops and Out-Loops in Lifelong Higher Education
- C 1.7 Seventh Second: Higher Education in the VUCA World
- C 1.8 Eighth Second: From Control to Culture – Towards Empowering Learners
- C 1.9 Ninth Second: Informal Learning in Higher Education
- C 1.10 Tenth Second: Badges & Microcredentials
- C 1.11 Summary and Conclusion

C 2 Rethinking Learning, Teaching and Research: An Agenda for Higher Education of the Future

- C 2.1 Higher Education of the Future: A Thought Experiment
- C 2.2 Rethinking Learning: Future Learning Concepts
 - C 2.2.1 Digital, Networked and Informal
 - C 2.2.2 Beyond Disciplines
 - C 2.2.3 Flexible Study Pathways
 - C 2.2.4 Soft Skills as a Hard Currency
 - C 2.2.5 From Defensive to Expansive Learning
 - C 2.2.6 The Future of Assessment
- C 2.3 Rethinking Higher Education: Towards an Evolved Organisation
 - C 2.3.1 The New Digital – Transformation Beyond Technisation
 - C 2.3.2 From Programs to Missions
 - C 2.3.3 Recognition of Prior Learning
 - C 2.3.4 Microcredentials & Alternative Certification Methods
 - C 2.3.5 Lifelong Academic Learning
 - C 2.3.6 Integrating Theory and Practice

- C 2.3.7 From Isolation to Permeability
- C 2.4 Summary: The Dawn of the Future of Higher Education

C 3 Four Scenarios for the University of the Future

- C 3.1 A Framework for the University of the Future
 - C 3.1.1 Pillar 1: *Future Skills* Focus
 - C 3.1.2 Pillar 2: Multi-Institutional Study Programmes
 - C 3.1.3 Pillar 3: Personalisation of Academic Learning
 - C 3.1.4 Pillar 4: Lifelong Learning
- C 3.2 Scenarios for the University of the Future
 - C 3.2.1 Scenario 1: The *Future Skill* University
 - C 3.2.2 Szenario 2: The Multi-Institutional Networked University
 - C 3.2.3 Scenario 3: The Personalised MyCurriculum University
 - C 3.2.4 Scenario 4: The Lifelong Learning University

Part D Final Act: Summary and Epilogue

Glossary

Bibliography

Figures

- Fig. 1 Agenda – the bigger picture
- Fig. 2 Research questions of the *NextSkills* Studies

Fig. 3 Methodological design of the <i>NextSkills</i> Studies	1
Fig. 4 Design of the Delphi Study I + II (Source: Ehlers & Kellermann 2019)	2
Fig. 5 The three dimensions of <i>Future Skills</i>	3
Fig. 6 <i>Future Skills</i> overview – allocation to three dimensions	4
Fig. 7 The <i>Triple Helix-Model</i> of <i>Future Skills</i>	5
Fig. 8 Shifting focus of object-related competences	6
Fig. 9 Organisational change in <i>Future Organisations</i>	7
Fig. 10 Areas of change	8
Fig. 11 The <i>Future Skills</i> concept from a competence perspective (own illustration)	9
Fig. 12 <i>Future Skills</i> map – Overview of 17 skills profiles from three competence fields	10
Fig. 13 <i>Future Skills</i> space of action	11
Fig. 14 Overview of <i>Future Skills</i> profiles	12
Fig. 15 Subject development-related skills: Importance versus higher education institutions' readiness to promote <i>Future Skills</i> development (N = 46)	13

List of Figures and Tables

- Fig. 16 Discrepancy values for subject development-related skills between skill importance and higher education institutions' readiness (N = 46)
- Fig. 17 Object-related skills: Importance versus higher education institutions' readiness to promote *Future Skills* development
- Fig. 18 Discrepancy values for object-related skills between skill importance and higher education institutions' readiness ($N_{\text{Importance}} = 44$, $N_{\text{Support}} = 45$)
- Fig. 19 Organisation-related skills: Importance (dark blue bars) versus higher education institutions' readiness to promote *Future Skills* development (light blue bars) (N = 45)
- Fig. 20 Discrepancy values for organisation-related skills between skills importance and higher education institutions' readiness (N = 45)
- Fig. 21 Stage model of professional competence (Source: Wildt 2006) . . .
- Fig. 22 Agile, holacratic structures in self-managed organisations
- Fig. 23 Speed of digital development (inspired by Ibrahim Evsan 2015) . .
- Fig. 24 Effect of digitisation on the labour market (own illustration based on data from OECD 2019)
- Fig. 25 Race between technology and education
- Fig. 26 Rate of first-year students 1990 to 2015 in Germany (Source: Gehrke & Kerst 2018)

Fig. 27 Forecast of student numbers in Germany up to 2050 (Source: von Stuckrad et al. 2017)	
Fig. 28 Diversity of students in Germany (illustration based on Dräger 2014)	
Fig. 29 Individual learning literacy and skill development	
Fig. 30 Time of adoption for <i>Future Skill</i> learning literacy (N = 46)	
Fig. 31 Time of adoption for the capacity to act in emergent, uncertain contexts (N = 45)	
Fig. 32 Interrelation between knowledge, action and professionalism (illustration according to Wildt 2006)	
Fig. 33 The Reflective Practitioner (own illustration, based on Schön 2006)	
Fig. 34 Teaching strategies (Ehlers 2010; illustration according to Baumgartner 2004)	
Fig. 35 Pressure factors impacting higher education institutions	
Fig. 36 Inter- and transdisciplinary learning	
Fig. 37 Time of adoption for <i>Future Skills</i> equivalent to knowledge-based model (N = 38)	
Fig. 38 Time of adoption for the increasing importance of the capacity to act in emergent, complex future contexts (N = 38)	
Fig. 39 Time of adoption of interactive socio-constructive learning designs in higher education (N = 37)	

Fig. 40 Time of adoption for mainstreaming learning communities in higher education (N = 38)	10
Fig. 41 Time of adoption for mainstreaming “Assessment as Learning” (N = 38)	11
Fig. 42 Time of adoption for peer assessment instead of traditional assessment (N = 37)	12
Fig. 43 Time of adoption for multi-institutional & patchwork study pathways (N = 38)	13
Fig. 44 Time of adoption for microcredentials and alternative certification systems (N = 38)	14
Fig. 45 Time of adoption for lifelong academic education (N = 39)	15
Fig. 46 Time of adoption for lifelong, episodic study experiences (N = 38)	16
Fig. 47 Time of adoption for openness of higher education institutions for permeable access pathways (N = 38)	17
Fig. 48 Time of adoption for selected higher education developments	18
Fig. 49 The four pillars of the future development of higher education with experts’ opinion (N = 46)	19
Fig. 50 Time of adoption for the increasing importance of <i>Future Skills</i> focus for higher education (N = 40)	20
Fig. 51 Estimated time of adoption for the increasing importance of multi-institutional courses of studies (N = 39)	21
Fig. 52 Time of adoption for the increasing importance of personalised academic learning (N = 39)	22

.....	
Fig. 53 Time of adoption for lifelong academic education (N = 39)	
Fig. 54 Experts' evaluation of importance and time of adoption of the scenarios for higher education (NRunde1 = 46, NRunde2 = 38)	
Fig. 55 Four future scenarios for the University of the Future	
Fig. 56 Time of adoption for an increasing importance of the <i>Future Skill</i> University scenario (N = 46)	
.....	
Fig. 57 Multi-institutional study paths scenarios (Source: Ehlers et al. 2011)	
.....	
Fig. 58 Time of adoption for the Multi-institutional University Network (N = 46)	
.....	
Fig. 59 Time of adoption for the increasing importance of the MyCurriculum scenario (N = 46)	
.....	
Fig. 60 Time of adoption for the Lifelong Learning University (N = 46) ..	

Tables

Table 1 <i>Future Skills</i> : Competence clusters and profiles	
.....	
Table 2 Comparative analysis of existing <i>Future Skills</i> models	
.....	
Table 3 Projecting higher education into the future	
.....	
Table 4 Scenario Building: current and future higher education – students' perspective	
.....	

***Future Skills* - The Key to Changing Higher Education**

#lead-in

Future Skills has contributed to a decisive change of the public discussion about higher education, which we refer to as the *Future Skills Turn*. To examine this *turn* and its implications for the future of higher education is the purpose of this book. As a concept, *Future Skills* has gained an importance similar to that which emerged in the seventies of the last century from ideas such as *equal opportunities* or *science orientation* in European education. Such guiding principles usually do not appear as precisely tailored and empirically operationalized concepts, but rather as conceptual condensations of broadly diversified bundles of arguments and objectives – equally in the public, the political and the scientific discourse.

The starting point for the enormous career of the *Future Skills* concept is the insight that current concepts of higher education do not meet the urgent needs of our societies with convincing future concepts. Neither they are fit to help sustain our environment nor associated social or economic challenges. While social challenges are exacerbated by an accelerating process of globalization and digital advancement, at the same time these are the very forces that enable a multitude of new options for human development. In this situation of digital acceleration, the characteristic feature is that of uncertainty and the inevitable necessity is that of creative responsibility. It is a

platitude that the future is unpredictable, however we must be prepared to shape it.

In ten to twelve years' time, children who attend primary school next year will be entering vocational training or higher education, and in fifteen years' time they will be the new professionals who as young citizens take over the responsibility in our society. We know little about this future. In the year 2060-2065 they are likely to retire, end their employment and/ or cease working. About this future we do not know anything. Our schools must prepare them for jobs that do not yet exist, for technologies and applications that have not yet been invented, for living in a society whose social structures we cannot foresee today, and for dealing with challenges that are not yet discernible. It is our shared responsibility to make the most of the opportunities and find ways to deal with this uncertain future. It is about nothing more and nothing less than the preservation of our planet and our livelihoods.

Solving social problems, such as those associated with climate change, the challenges of migration, which will continue to increase in the future, the conflicts arising from populist social and political drafts and the associated question of the future of our democracies – all this requires the ability to develop new and so far unknown approaches, to tread new paths and to relate the hitherto unconnected to one another in a new way. In education and science, this will only succeed if we work inter- and transdisciplinarily in the best sense of the word, to compile solutions and contributions of each of the disciplines and sciences, to reflect critically on them and to relate them to one another. This, however, is a big challenge. Higher education Institutions are struggling with it because they all share a common handicap: The history of science, research and thus also of higher education is a history of “silo-ism”, specialisation and differentiation of disciplines – the almost 18,000 degree programmes offered at German higher

education institutions alone are proof of this. The old institution of higher education is faced with the challenge of having to reinvent itself – in a time when academic education is experiencing an enormous growth process and is projected to reach 70 percent plus of an age cohort worldwide by 2050. It's like having to replace the pilot in a car race, right in the middle of a steep turn and during a risky overtaking manoeuvre.

#futureskills

The research project *NextSkills* aims at finding models and descriptions for future relevant skills, so-called *Future Skills*, within the framework of a multi-methodological research design and through international consultations.¹ *Future Skills* should be the skills that enable university graduates to master the challenges of the future in the best possible way. The results show that to deal with future challenges, students must develop curiosity, imagination, vision, resilience and self-confidence, as well as the ability to act in a self-organised way. They must be able to understand and respect the ideas, perspectives and values of others, and they must be able to deal with mistakes and regressions, while at the same time progressing with care, even against difficulties.

In numerous conversations, interviews and analyses, it became clear to us *that Future Skills* must also strive to raise awareness for local and global challenges; to raise awareness and become mindful of how climate change impacts on nature and the environment – and to focus with greatest attention on how students can acquire skills to participate in societal contexts in order to reduce or reverse these impacts. It is also about shaping social issues such as demographic- or migration challenges.

Promoting *Future Skills* also means to strive for creating an educational system that enables future citizens to deal with the challenges involved and to care for greater coherence in society, to value openness, tolerance and an awareness of differences and diversity, and not to succumb to populist explanations. It became clear to us that the question of how young people can be empowered to participate in social systems and processes, and how we can strengthen justice, peace and the integrity of creation and community as values in a future society, will determine the relevance of our higher education Institutions in the future.

At the same time, today's specialist and expert knowledge will only represent a small part of what future generations will be able to draw on in their search for solutions to complex problems. Next generations will be driven by more than career prospects, a good job and a high income. They will also strive for the well-being of their friends and families, their communities and the planet as a whole. Empathy, mindfulness and passion will become explicit educational objectives of the higher education institutions of the future. It will be about realising educational concepts that equip learners with strength, energy and conviction and with the ability to communicate them in an appreciative and effective way. The skills they need must enable them to shape their own lives and contribute to the well-being of others.

Higher education institutions would do well to turn away from the goal of imparting knowledge that is primarily concerned with self-contained and easily verifiable relations for which there are right and wrong answers. In the future it will be important to study on the basis of questions for which there are no immediate correct answers, but in which it is a matter of weighing, plausibly arguing and representing value attitudes and orientations. The *NextSkills* project was launched to find out what these skills are and how they can best be developed. The aim of this project is

to provide universities, their management and their teachers with answers on the direction in which educational goals, structures and processes need to be shaped. The focus is on three questions:

1. What skills will people need in the future to shape their world and environment as citizens in an increasing globalised context? What skills do employees need in order to cope with the constant development and constant adaptation to new situations in organisations and working life? We call these skills *Future Skills*.
2. How can organisations help their staff to acquire these skills and what organisational forms and structures are needed to develop the optimal organisational cultures for this?
3. What can higher education institutions do to promote these skills among students? How should studies and teaching be structured, and which forms of higher education didactics and learning designs are suitable?

In this book we describe the results of this work. The concepts presented are backed up by in-depth interviews, expert assessments and international Delphi Studies.

If *Future Skills* are placed at the centre of considerations for higher education, then the need to rethink higher education as a place of research, teaching and learning becomes apparent at many points. And the following applies: Everything that is easy to teach and easy to assess is also easy to digitise – and thus also to automate. *Future Skills* such as creativity, self-organisation-abilities, self- and reflection competence or Design Thinking Competence, however, require ingenious forms of learning, teaching and development. It is therefore a question of how the promotion of *Future Skills* can be anchored in higher education curricula. This involves concentrating on active, creative forms of teaching and learning and educational

objectives that require complex assessment scenarios, and that go beyond the mere transfer of knowledge and focuses on the development of specific competences.²

#stateofplay

The *NextSkills* studies does not take place in a vacuum. The question which skills should form the basis of learning concepts is highly relevant in any higher education system for current and future generations – and one that has already been discussed in many different ways and places. After research on graduate attributes was in the foreground in the eighties and nineties of the last century, there is currently a veritable renaissance of scientific work on this topic. These are, firstly, labour market studies that raise the question of what the future of increasingly digitised workplaces will look like. Secondly, these are studies of societal scope which pose the question what society will look like in 2030 or 2050. These are questions like: Will work continue to be the sense giving element in our common lives? What are the risks that individuals in a society have to cope with and what are the best strategies to cope with them? Here, too, the digital penetration of the entire private sphere plays a major role. And thirdly, the question which educational concepts are suited best to prepare students for unpredictable futures. And finally, there are numerous approaches emerging in the field of international organisations starting with the famous report by Jacques Delors in 1996 to the European Union (EU) stressing “living together” as a central educational objective, the Organisation for Economic Co-operation and Development (OECD) or the United Nations Educational, Scientific and Cultural Organisation (UNESCO), all raising the question how societies can learn and live together in such a way that global challenges can be adequately and effectively

addressed. All these different perspectives, which have been increasingly discussed since the 1990s, are moving into focus through international cooperation, global networking and digitisation. The discussions are reflected in concepts such as the seventeen Sustainable Development Goals (SDG) and further international, cross-border education and society future scenarios.

The question which skills young people of generations to come will need to cope with the challenges described above is therefore a highly topical one. It is much discussed and is currently one of the hot topics, not only in educational science, but also in economics, organisation- and labour market studies. Most of the approaches are empirically analytical and attempt to predict the future by analysing existing developments, projecting them into the future, for example by taking the development of new occupations and occupational fields as a basis or by (linearly) updating the speed of technology development and its application to automation in work processes, thus creating new professional profiles. From these, requirements are derived, which are then developed into competence profiles in schools and universities. This approach has limits that are now becoming increasingly foreseeable.

#emergence

It is clear that the debate on the future capabilities needed to meet the societal challenges of present and future generations must take into account one thing in particular: An ever faster and non-linearly changing context of action. This characteristic is finding its way into more and more educational concepts – initially on a purely descriptive level. The question is how higher education can deal with situations in which the very nature of knowledge is changing, and knowledge is becoming one amongst many