From Life Skills to Future Skills: Competencies that Nowadays' Children Will Need in Ten Years' Time

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Abstract

During the past decade school systems have introduced life skills education in various forms in their curricula. Future challenges in society, global and regional, call for an adaptation of the concept of life skills education with a more future-oriented approach. These so-called future skills are subject of this article. In this respect theoretical frameworks of both approaches are presented and the shift from life skills education to future skills education is illustrated [1],[2]. In the light of different compilations of future skills or "transformative competencies" [3] that have been developed by in the last five years the question is raised about which skills nowadays' school children will need in their future personal and professional lives [3], [4], [5], [6], [7]. Future skills as a concept are discussed from the perspective of teacher in- and pre-service education and its implementation in compulsory schooling. As a suggestion, driven by the experiences in international cooperation projects of the Zurich University of Teacher Education a set of characteristics for future skills learning programs is presented. The set includes hints on how to formulate learning goals and competencies, how to develop content and topics, which teaching and learning methods to apply, how to include reflection and assessment of learning processes as well as general remarks about a future skills-oriented mindset of teachers. Teachers have a central position in this development, as they must adapt their own understanding of their role in context-specific teaching practices to support learners so that they can acquire and effectively apply the knowledge, attitudes, and skills necessary in their future development and learning. It is therefore important to provide teachers with a professional development that enables them to accept the challenge in the interests of high-quality education. Teachers need to be equipped so that they are active as facilitators in practical project-based teaching processes, involving learners in decision-making processes, staying in dialog with each other to learn from each other (peer-learning) and preparing learners and themselves for current world events in a collaborative way. In transition countries, such as the Republic of Moldova, teacher training still emphasizes theory to an extent that is at the expense of practical relevance. A reform of the curricula at universities would be very welcome, as we are convinced that a solid reflection on everyday practice can lead to teachers being seen more as facilitators in the process of developing future skills than as mere lesson providers.

Keywords: *life skills, future skills, transformative competencies, learning program, teacher education, peer-learning, professional development*

1. Introduction

The world is increasingly falling apart. Wars, climate disasters, terrorism, the rise of radical regimes, and the loss of faith in democracy dominate our daily news feeds. What will our future look like, especially that of our children? In what world will today's schoolchildren live and work ten or twenty years from now? What do they need right now to be able to cope with the challenges that lie ahead? Is our school system prepared for this? Or are we exaggerating everything? Are we instilling fear about the future, causing our attempts to adequately prepare children to backfire? How can we motivate learners and involve them positively in the world, equipping them with the necessary skills for it?
These questions are more evident than ever before even though the need to train learners in transversal skills as much as in disciplinary subjects has been present in education worldwide for the past ten years. The educational discourse on programs focusing on life skills, 21st century skills,

transversal skills or future skills has shaped curriculum reforms in many countries around the world. Be in through specifically developed school subjects or cross-curricular teaching and learning activities, getting equipped with the necessary competencies and skills for facing small problems in everyday life as much as contributing to the solution of big problems of societies education and school have adopted the necessity for life skills or transversal education. However, in the light of the overwhelming challenges of the future, the discourse on the formerly known life skills has incorporated a future-oriented dimension including attitudes and values as well as specific competencies. The transition from the formerly used life skills approach to the approach towards future skills is the subject of this article always bearing in mind the central question: Which competencies and skills will nowadays' children need in their future professional and private lives and how does formal and non-formal education contribute to this?

2. Life Skills And Their Significance For Education

Before we define life skills for the educational context and examine the integration of the life skills approach into formal and non-formal education it is important to also analyse the roots and the presence of the life skills concept in different areas of society. Life skills are not only a concept used by education.

According to Murphy-Graham & Cohen [8] the three areas of discourse in life skills are: prevention & protection (public health), labour market outcomes (economy) and quality education (education). Taking a closer look at these three areas the different shapes and focus points are interesting and are briefly presented here [8]:

a) Prevention & protection (public health) - Focus on healthy choices, protection from risky behaviour (e.g. drug use, unprotected sex, gang involvement). Decision-making, communication, resisting peer pressure and self-knowledge and care are the most important life skills.
b) Labor market outcomes (economy) - Focus on life skills that are important for the labour market, for employment, productivity, job quality, entrepreneurship, and earnings. The "big five" personality domains such as conscientiousness, openness, extraversion, agreeableness, emotional stability, as well as teamwork, communication and problem-solving are the most important life skills.
c) Quality education (education) - Focus on well-being outcomes, meeting day to day challenges and making informed decisions. Leadership, communication, critical thinking, social and emotional competencies and 21st century skills are the most important life skills.

Even though these three areas put different emphases on life skills there is common ground when examined a little closer. The core areas that overlap in the idea that children and young people "need to: 1) master certain tasks, knowledge and/or information, (2) develop a group of social and emotional competencies that will lead to valuable behaviours, and; (3) have ways of thinking that we consider to fall within the category of critical thinking." [8].

Considering the development of the life skills concept in these three areas it becomes also evident that even though life skills in the public health sector already started in the 1990s and discourse in economy and education followed in the early 2000s the goals and contents were influenced by the first discourse but soon overlapped and derived the parts necessary for the specific sector.

Examining the field of education more thoroughly the life skills approach as originally defined by the World Health Organization (WHO) in 1998 was used as a reference for many initiatives and programs that followed, not only focusing on health or prevention but also on other aspects. The WHO's definition of life skills gained prominence as early as 1998 as "the abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life " [1]. These skills encompass decision-making, problem-solving, creative, and critical thinking, effective communication, interpersonal skills, self-awareness, empathy, and the ability to manage emotions and cope with stress [1]. International organizations have started using life skills approaches for several education projects in the field of international development education, using the concept as the "bottom line message about education quality" [8]. In addition to literacy and numeracy skills, life skills are seen here as the key component of education quality [8]. Among all approaches in this field and among all organizations, there is consensus that learners should develop life skills as an element of quality education [9], [10], [11], [12], [13].

UNICEF's example illustrates this: Still focusing on health, but also on health education, UNICEF outlined a model for life skills, encapsulated in an A-S-K framework of competencies. This model represents "a behaviour change or behaviour development approach designed to address a balance

of three areas: knowledge, attitude and skills" [2]. UNICEF's definition is underpinned by research which suggests that fostering changes in risk behaviour is unlikely without simultaneously addressing knowledge, attitudes, and skills-based competencies [2]. When we delve into the specific skills, various international organizations collectively identify ten fundamental life skill strategies and techniques, which encompass problem-solving, critical thinking, effective communication, decision-making, creative thinking, interpersonal relationship skills, self-awareness enhancement, empathy, as well as techniques for coping with stress and managing emotions [2].

3. From Life Skills to Transformative Competencies

Given the rapidly evolving nature of our societies, encompassing changes in the environmental, economic, and social spheres, the OECD Learning Framework 2030 underscores the necessity for broader educational objectives [14]. This forward-looking vision places a strong emphasis on individual and collective well-being, with education playing a pivotal role in the pursuit of these objectives. According to this vision, education is seen as a critical means of developing the knowledge, skills, attitudes, and values that empower individuals to contribute to and thrive in an inclusive and sustainable future. The ability to set clear and purposeful goals, collaborate with individuals holding diverse perspectives, discover unexplored opportunities, and devise multiple solutions to complex challenges will be indispensable in the years ahead. Education's purpose should extend beyond merely preparing young people for the workforce; it should also equip learners with the skills necessary to become active, responsible, and engaged citizens [14]. The demand for an inclusive education system that places learners at the heart of their learning journey, coupled with a personalized environment that nurtures and inspires each student, fosters connections between various learning experiences, and empowers learners to shape their learning processes collaboratively with others, is emphasized [14].

Following the OECD Learning Compass within the Learning Framework 2030 the overview of all the skills that are likely to be important in the future shows strong connections to the life skills concept [14]. OECD defines them as “transformative competencies”, describing skills “that students need in order to contribute to and thrive in our world, and shape a better future” [14]. According to the authors, these transformative competencies are distinctively human and “can be seen as higher-level competencies that help learners navigate across a range of different situations and experiences” [15]. Transformative competencies are therefore transferable and can be used throughout one’s entire life. The OECD divides the transformative competencies into three main areas: (1) creating new value, (2) reconciling tensions and dilemmas and (3) taking responsibility [14].

The OECD Learning Compass 2030 takes another step forward and looks at the future challenges and opportunities in the education sector. This visionary concept aims to align education systems worldwide with the needs and requirements of the 21st century. The Learning Compass 2030 promotes a holistic approach to education that goes beyond the teaching of subject knowledge and emphasizes the development of key skills such as creativity, critical thinking, social intelligence, and digital literacy. The aim is to better prepare young people for a constantly changing world and to provide them with the skills and knowledge they need to succeed in a globalized society. The concrete key competencies within the framework of the described three areas of transformative competencies of the OECD Learning Compass 2030 that are considered crucial for success in an ever-changing world are as follows [14]:

1. Critical Thinking: The ability to analyse information, evaluate it, and make informed decisions.
2. Creativity: The ability to develop innovative solutions for problems and generate original ideas.
3. Communication: The ability to communicate effectively, both orally and in writing, and convey information clearly.
4. Collaboration: The ability to work in teams, resolve conflicts, and collaborate productively with others.
5. Self-Regulation: The ability to exercise self-control, self-motivation, and engage in independent learning.
6. Digital Literacy: The ability to effectively use digital technologies, conduct online research, and develop media literacy skills.
7. Social Intelligence: The ability to be empathetic, build relationships, and appreciate cultural diversity.
8. Entrepreneurship Skills: The ability to develop entrepreneurial thinking and actions to promote innovation and competitiveness.

9. Global Citizenship: Understanding global challenges, cultural diversity, and the willingness to take responsibility as a global citizen.

In the discourse about the uniqueness of transformative competencies the OECD's authors claim that the three big competency areas are uniquely human [14]. Any form of artificial intelligence (AI) cannot compete with the skills integrated into any of the three areas.

4. Transformative Competences = Future Skills?

There is an ongoing debate in academic circles [16] as to whether 'transformative skills' are synonymous with 'future skills' or '21st century skills'. While 21st century skills tend to encompass creativity, collaboration, critical thinking and communication, transformative skills extend further into the future and serve as tools to address societal changes and challenges with confidence and resilience [17]. These include skills related to achieving common goals, engaging in dialogue, managing conflict, and adapting to change.

Future skills encompass competencies that enable individuals to self-organise and thrive in highly emergent contexts of action, solving complex problems [4]. They are based on cognitive, motivational, volitional, and social resources and can be acquired through learning processes. Future skills emphasise the urgency of action and are distinct from transversal skills [4]. This future orientation is reflected in fundamental changes in the way learning is perceived in educational institutions, such as the need for less standardised learning, the translation of specialised knowledge into actionable competence, and navigating hierarchical structures [4].

The NextSkills study by Ulf Ehlers [4] identifies 17 future skills across three dimensions: individual development-related, individual object-related and individual organisation-related [4]. These include skills such as learning, design thinking, sensemaking and collaboration. Similar explorations of future skills are emerging in both German- and English-speaking regions, with lists of advocated skills evolving or differing in minor details (Karrierebibel.de).

An examination of the original concept of future skills and its three relationships - individual, object, and organisation - could be aligned with the OECD's areas of transformative competences. This could provide a blueprint for organising future skills or the OECD's nine key competences.

5. What Will Our Future Hold In Store And What Will Be Best To Learn?

A different perspective in the discourse about future skills uses future scenarios for developing skill sets. The Future Skills study by the Gottlieb Duttweiler Institute also identifies three dimensions into which Future Skills can be categorized, particularly emphasizing their relevance to schools and learners [5]. The four possible scenarios for our future, as outlined in the study, are:

1. ***Collapse***: A world where there is no more international trade, and everything operates locally. In this scenario, people must reorganize themselves amidst the "ruins" of a globalized and industrialized world. Survival depends on possessing craftsmanship skills, engaging in knowledge exchange with others, being highly adaptable and stress-resistant, and collaborating with unknown individuals.
2. ***Gig-Economy Precariat***: Due to digitization, machines have taken over many jobs, resulting in a shortage. Although freedoms are not restricted, inequalities have intensified. Only small elites live in prosperity. Survival depends on being able to work autonomously, being digitally adept, thinking entrepreneurially, and effectively managing stress.
3. ***Net-Zero*****:** In a world where abundance reigns, most people lack nothing. Individuals have recognized the need to live climate-neutral, leading to restricted freedoms. Survival depends on emotional stability, possessing craftsmanship skills, experiencing self-efficacy, and having a certain level of knowledge in economics and ecology. The willingness to engage in the community, appreciate non-material values, and make democratic decisions becomes increasingly important.
4. ***Fully Automated AI Luxury*****:** Due to digitization, machines have taken over many jobs here as well, but the results are not reserved for a small elite. They are accessible to everyone, leading to a lack of scarcity. Digitization is experienced as liberation, not a threat, as everything is digitally available for free. Survival thrives on the ability to set long-term goals independently, take responsibility for them, and have the courage to make mistakes. Curiosity, creativity, and imagination, as well as trust in the community and the ability to make decisions in a group, become more important. A technological understanding of AI, as well as the ability to comprehend essential information from statistics or similar sources, gains significance.

Regardless of which scenario occurs or occurs in a partial or mixed form, individuals will need to demonstrate their abilities in three dimensions: Knowledge, Willingness, and Action [5]. Drawing a conclusion from the partially gloomy, partially exuberant scenarios results in a set of skills that will undoubtedly be crucial for survival in an uncertain future.

Knowledge: People need a form of foundational knowledge about democracy, economy, environment, and technology. They must also know how to acquire information and be able to process it. This includes at least a basic understanding of scientific texts and the ability to question their own knowledge.

Willingness: Individuals must be able to recognize their own competencies and be willing to use them responsibly. They need to show a willingness to develop new ideas, especially in collaboration with others. Self-directed learning, self-responsibility, introspection, reflection on emotions and needs, creativity, imagination, as well as questioning societal values and existing truths are part of this dimension. The willingness to engage in community, think in longer time horizons, and feel a sense of responsibility toward future generations is a central focus of these Future Skills. This also includes trusting others to do the same.

Action: To tackle future challenges, individuals must act. Awareness of one's own effectiveness and implementation, the courage to make mistakes, perseverance, as well as practical and manual skills, administrative abilities, concrete computer skills, and a certain organizational capacity will be of high importance. In the realm of action, working with others, showing empathy, listening to others, handling decision-making processes in a group, and, above all, conveying one's own ideas are also crucial.

6. How Can Teachers Support A Future-skill Oriented School And Be Supported Themselves?

Schools play a crucial role in shaping the future of education in today's rapidly changing world. The promotion of equal opportunities and adaptability is an important part of this, as schools move away from rigid curricula. To prepare learners for the uncertainties and challenges of the future, promoting future-ready skills and competencies in the classroom is key. This includes encouraging critical thinking, collaborating, and applying knowledge in different subject areas. Schools should also prioritise the promotion of questioning and individual engagement over rote learning. The key to meeting the complex challenges of the future is to ensure that learners are educated with the right balance of knowledge, preparedness, and practical skills.

In this context, the changing role of teachers over time represents both a challenge and an opportunity. Teachers play a crucial role in fostering future skills by creating engaging learning environments and integrating new pedagogical approaches and technologies. At the same time, these changes offer the opportunity to create more dynamic and effective learning environments that are better suited to preparing learners for the demands of the modern world. Flooding teachers with training programs is not the answer; instead, targeted career coaching can make a significant contribution to individual and institutional development. Balancing these responsibilities requires targeted support, including access to training and coaching, and providing resources for professional development. Collaboration, participation, feedback, coaching, and reflection are integral aspects of effective teaching practice, beyond merely imparting knowledge.

To support teachers in their professional development, practical and long-term training courses accompanied by individualized coaching are essential. Teachers should also engage in continuous reflection and peer learning to promote ongoing growth and development. Mentors and coaches play a vital role in helping teachers and learners set goals, develop strategies, and overcome obstacles, ensuring that both realize their full potential [18], [19]. This process not only requires resources and support from the education system, but also requires teachers to step out of their comfort zones, share personal experiences, and foster trust and intentional communication.

In addition to issues such as the use of digital technology, stress management techniques and inclusion, aspects such as collaboration, participation, feedback, coaching and reflection should be considered as integral parts of pedagogical practice. Collaboration goes beyond cooperative learning methods in the classroom to promote student collaboration; it also plays an important role within the teaching staff. It's imperative that university and school professionals see themselves as a learning community that strengthens academic and professional competencies through mutual learning.

Schools can set up specialized teams or interdisciplinary working groups to achieve common goals at institutional level. Continuous reflection on one's own teaching and courses is essential in educational institutions. Teachers should use reflection through targeted observation and constructive feedback with colleagues (peer learning, team learning) as a tool to promote continuous learning and

professional development. As role models, teachers encourage learners to reflect on their own learning processes and actions.

A case study from international cooperation in education: In the Republic of Moldova, teacher training is still mainly focused on the transfer of knowledge rather than on the practical aspects of teaching and learning. As a result, teachers function mainly as transmitters of knowledge. This can lead to a lack of practical relevance. Nevertheless, there have been developments in the education system, such as the regular adaptation of the curriculum and the introduction of competency-based education in areas such as personal development and civic education. There have also been recommendations for new teaching and learning materials and numerous training programmes. However, the practical implementation of these innovations in the classroom is often perceived as ineffective. This is because the training courses often only provide information, and the practical application of materials and methods by teachers is not sufficiently supported. It would therefore be desirable to make the curricula practice-orientated and to plan a practical and target group-oriented introduction. Projects such as 'Better Teaching for a Better Future' (funded by the Charity Fund of the Canton of Zurich) and 'REFLECT Phase II - Quality Learning through the Peer-to-Peer System in Moldova', funded by the Swiss government as part of the 'Moldova - Promoting Active Citizenship' programme, train Moldovan teachers to incorporate the approaches into everyday life. The trainings are compact and very active, with hands-on practice, which is generally well received by teachers. Although there is some resistance to the additional workload and to changes in learner behaviour and teaching, the practical teaching tools and approaches indicate that changes are beginning to take place towards more active teamwork in universities and the development of implementation strategies for existing courses. In addition, the introduction of professional reflection on daily practice can help teachers to be role models for future teachers and to be perceived as facilitators in the process of future competence development. The training programmes are being developed in a participatory approach with Moldovan experts and have the potential to change the mindset of the teachers from the inside out so that they can adequately prepare the future generation of teachers and learners. This requires courage, openness, and trust in oneself, but also in the team.

7. Characteristics Of Future Skills Programs

In the light of all definitions, descriptions, and clarifications about transformative or future skills we ask ourselves the question: How do successful programs have to look like in terms of their structure, goals, and contents to contribute to the development of the forementioned competencies? In addition to that, what are the teaching and learning methods that can be foreseen to prepare children and young people for the unknown future? The following table gives a concise overview of the different criteria for creating meaningful learning opportunities for future skills education.

Criteria	Indicators	Descriptions and examples
Goals and Competencies	- Goals focus on competencies and transformative skills - Are communicated to the learners - Learning programs should be aligned in a spiral curriculum - Be aligned with the present curriculum and foresee cross-curricular teaching opportunities	- Blooms Taxonomy for formulating goals, using active verbs - Repeating key concepts at a more complex level throughout the entire program - Defining the “core” subject in which future skills are in the focus
Contents and Topics	- Contents and activities have to have a significance in the present and future lives of learners - Contents must be aligned with knowledge, willingness, action - Contents and topics must be discussed in a participatory way - Background knowledge and materials are provided by the teacher - Knowledge in the community is integrated into school and made visible	- Using every-day life examples - Activities cover all three dimensions of future skills education, e.g. climate change: - Knowledge: What effects does carbohydrate have on different dimensions of life (humans, animals, plants, sea etc.) - Willingness: How do I personally deal with climate change and how do I feel about it? - Action: What could I and we change about our daily life?

Teaching And Learning Methods	- Peer learning and co-operative learning settings essential - Methods are based on a cooperation-oriented classroom structure, not a competition-oriented one - Project-orientation and task-based learning - Learners become active as soon as possible - Introduce new and innovative teaching and learning methods - Constant use of digital learning	- Working together on a participatory project, e.g. our visions for our school(yard) etc. - Introducing methods to do research on the internet - Peer feedback as a fixed element after intensive learning phases - Using model lessons - Differentiating between pure online sessions, hybrid sessions and face-to-face sessions; Co-operation in all settings
Continuous Reflection	- Reflection by all actors involved - Regular - Self-reflection and reflection by others - Reflection-in-action and reflection-on-action - Identify blind spots through self-reflection and peer feedback	- Using self-reflection and peer feedback for individual and group tasks (e.g. oral presentations, group presentations etc.) - Using tools such as the JOHARI window for separating the dimensions of observation and perception
Assessment of learning processes	- Assessment based on individual and criteria orientation - Formative assessment as the central form of assessment	- Using self-assessment techniques and peer reflection, peer feedback, regular peer visit - Regular peer feedback among learners after presentations etc.
Mindset of teachers	- Mistakes are viewed as learning opportunities - Playfulness as the central driver for learning - Autonomy and freedom, self-efficacy and feeling of social inclusion - Inclusion and diversity as valuable - Orientation towards strengths - Openness to what is going on outside of school – close by and far away - Interest about what the current labor market needs - Openness to change own traditions, methods and views	- Adopting an iterative process - Using task-based learning approaches - Changing the channels for learning and involving different senses - Celebrating uniqueness in class - Installing partnerships with nearby stakeholders (e.g. old people's home, local NGO etc.) - Opening one's classroom, teaching and learning outside - Using the school's community for internal research activities - Valuing mistakes, "celebrating" lessons learned among teachers

8. Conclusion and Outlook

The conducted analysis and the ongoing implementation of the future skills programme in the Republic of Moldova show that this orientation must be based on the three basic pillars of knowledge, willingness, and action for not only the learners but for all stakeholders within the school partnership. But how to start? Schools, principals, and teachers need to commit themselves and adopt the necessary mindset for breaking up a traditional teaching and learning culture. This includes taking an active part in the decision-making processes on the possible focus points that will be adapted. In this respect, the "Future Skills Navigator" model can provide guidance and support (www.futureskillsnavigator.com/en/). We include this resource on purpose in our concluding section as a food for thought and an illustrative tool for exploration. It divides competencies into four fundamental "Future Skill areas." These describe the rational, emotional, spiritual, and transformative domains [20]. Three different levels come into play in the orientation or implementation of Future Skills. Me, you, us, and all (things). The authors assign the competencies mentioned above to each level that is or will be primarily concerned with it. The model that emerges describes concentric circles in four quadrants, which, from the inside out, first deal with the self, then with others, with us, and finally, with everyone or everything. For each skill and level, the Future Skills Navigator provides suggestions and implementation proposals. Thus, it becomes possible to "navigate" through the Future Skills landscape at different levels with different goals and groups. However, working with the Future Skills navigator also requires a mindset that is characterized by openness and flexibility, risk-taking and rather than

fear of failure, the feeling of psychological safety, a conscious focus on development rather than constant assessment and the awareness that the foundation for a future-ready school and education system can be laid through a systemic lens which considers also the environment outside the classroom, the school and the district.

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