

# Articles

## Didactic Principles by Comenius and 21<sup>st</sup> Century Skills

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*Nothing is easier, or more dangerous, than to treat an author of 300 years ago as modern and claim to find in him the origins of contemporary or recent trends of thought.* Jean Piaget

One might assume that the world has changed since the time of Comenius. But when thinking of current events, we can see that the core of problems remains the same; and what is frequently the same too is the way individuals or groups advance their own interests. Similarly to the 17th century, escalating violence, religious intolerance and social exclusion are encountered. Consequences resulting from the economic crisis and environmental problems have to be added today.

In what way is it necessary to educate individuals today if they have to be prepared for coping with various life situations in order to be able to lead full lives.

Educational needs can be identified on the basis of a prognosis with respect to the current situation and the previous universal knowledge defined by demands of the particular society. This "knowledge" that can be considered in both narrow (knowledge) or broader contexts (competences), depends of cultural capital and the quality of an individual's socialization, and thus it can be significantly different.

Rabušicová and Rýdl (2009, p. 513) distinguish between two possible interpretations of the concept of the knowledge society, namely from the perspective of importance of knowledge in economic activities and from the perspective of knowledge in social relations, when focusing on the role of education.

When focusing on our core competencies, it can be said that they are characterized by the following basic features:

- “they are beneficial for people and society
- they help people fulfill important demands imposed upon them under various conditions
- they are not important only for professionals but for everybody” (Rychen, Salganik, 2003, p. 6).

Specifically, the key competences are defined in curricular documents corresponding with the concept of educational policy of the EU and individual countries. Following these competencies the 21<sup>st</sup> century skills are currently discussed too. These skills are viewed in various transdisciplinary contexts and with regard to the framework for which they are established (i.e. employment policy and the labour market, educational policy and the shift of paradigm in the concept of education and its level) see (Bellanca, Brandt, 2010). There are several theoretical frameworks by which the 21<sup>st</sup> century skills can be defined (e.g. Wagner, 2008 Griffin, McGaw & Care, 2012, see also Hanover Research, 2011).

“Within the context of key knowledge instruction, students must also learn the essential skills for success in today’s world, such as critical thinking, problem solving, communication and collaboration” (P21 Framework Definitions).

Table 1

*21<sup>st</sup> Century Skills of Partnership for 21<sup>st</sup> Century Skills*

21 <sup>st</sup> Century Skill	Description
Learning and Innovation Skills	<b>Critical Thinking and Problem Solving</b> , e.g., effectively analyze and evaluate evidence, arguments, claims, and beliefs; solve different kinds of non-familiar problems in both conventional and innovative ways.
	<b>Collaboration</b> , e.g. demonstrate ability to work effectively and respectfully with diverse teams.
	<b>Creativity and Innovation</b> , e.g., use a wide range of idea creation techniques to create new and worthwhile ideas.
Information, Media, and Technology Skills	<b>Information Literacy</b> , e.g., access and evaluate information critically and competently; manage the flow of information from a wide variety of sources
	<b>Media Literacy</b> , e.g., understand both how and why media messages are constructed; create media products by understanding and utilizing the most appropriate media creation tools, characteristics and conventions.
	<b>ICT (Information, Communications, and Technology) Literacy</b> , e.g., use technology as a tool to research, organize, evaluate and communicate information.
Life and Career Skills	<b>Flexibility and Adaptability</b>
	<b>Initiative and Self-Direction</b>
	<b>Social and Cross-Cultural Skills</b>
	<b>Productivity and Accountability</b>
	<b>Leadership and Responsibility</b>

(Hanover Research – District Administration Practice, 2011, p. 10)

Wagner (2008) gives this list of the 21<sup>st</sup> century skills that are to be discovered, developed and promoted in education:

1. Critical Thinking and Problem Solving.
2. Collaboration across Networks and Leading by Influence.
3. Agility and Adaptability.
4. Initiative and Entrepreneurship.
5. Effective Oral and Written Communication.
6. Accessing and Analyzing Information.
7. Curiosity and Imagination.

What should be also mentioned in this context is a requirement for various minds, as stated by Gardner (in Bellanca, Brandt, 2010, pp. 9–31): the disciplined mind, the synthesizing mind, the creating mind, the respectful mind, the ethical mind.

Even though we respect the significant potential of this educational concept, we believe that it is not new or revolutionary in theory of education (cf. Andrew J. Rotherham and Daniel Willingham, 2009). It consists in redefining of the principles, which should be the basis of the quality lifelong learning, and which have been reflected in the pedagogical concepts for several centuries.

To maintain the continuity of educational knowledge and to provide inspiration in shaping the concept of the modern concept of education that is the goal of the formation of these 21<sup>st</sup> century skills, we would therefore like to focus on the main ideas and principles of Comenius' work now. Specifically, it is *Didactica magna*, *Analytical Methodology* and *Pampaedia*.

In his work Comenius synthesizes the knowledge of pedagogy, theology and philosophy. Comenius' main idea – and still valid – is *Omnes* – to educate all human beings without discrimination (the aim), *omnia* – in everything important for human life (the content) *omnino* – in the universal way of all-round development of a human being, both individually and socially (the method and methodology) (Čapková, 2009, p. 53). A requirement of education for all that is now reflected in the concept of inclusive education, versatility and the global approach to knowledge.

“At a time when education had neither stable institutions nor general programmes of study, Comenius endeavoured both to build up a rational administrative structure and to develop graduated, coherent programmes. All this elaborately detailed planning was dominated by a twofold requirement of unity: horizontal unity in respect of curricula at a given level and vertical unity in the hierarchy of the stages of education” (Piaget, 1993, p. 8).

The first systematic approach of didactics, covering the entire theory and structure of education, including the definition of the content, principles and methods of teaching, was developed by Comenius in *Didactica magna*; he also addresses educational issues, i.e. both the informative and formative components of education.

In accordance with the ethical-pedagogical principle, what Comenius regards to be the fundamental role of education is to reach an integral and harmonious development with regard to individual differences in each person (cf. Cipro, 1984, p. 163).

He emphasized the quality of modern pedagogy: rationality, harmony with nature, appropriate motivation and effectiveness of the entire education.

The sources of Comenius were Bacon's sensationalism (highlighting the importance of the sense organs), Aristotle (logic), general psychology and child psychology.

Comenius characterized clearly and briefly the psychological characteristics of cognitive processes of memory and age peculiarities of children.

Comenius' fundamental didactic principle that is consistently represented in all his teachings, was to teach everything by examples, with a rule and practice (inductive approach).

- I. "Let all things be deduced from the unchangeable elements of things.
  - II. Let nothing be learned by authority, but by demonstration, sensible or rational.
  - III. Let nothing be taught by the analytic method only, but rather by the syntetic"
- (Comenius, 1948, p. 131, Laurie, 1892, p. 96).

To find a way to share not only knowledge with pupils but also to identify and cultivate their complex 21<sup>st</sup> century skills, it is possible to use a transfer based on the principles that Comenius established, and that are further elaborated in the contemporary theory of education and didactics (Skalková, 2007, Obst, 2006 etc.).

Didactic principles are characterized by their subjective side. It is up to the teacher, his/her personal responsibility, qualifications, etc., whether he/she really implements the set principles, and whether they are applied comprehensively.

Comenius laid down principles of effective teaching, demanded internal discipline (self-discipline) from pupils and the use of teaching aids that change over time, but the principle of demonstration remains.

Table 2

*Comenius principles by Pampaedia and 21<sup>st</sup> century skills*

Comenius principles by Pampaedia (The General Consultation on the Reform of Human Affairs, 1643–1670) The Education of all – the way to mankind, humanity, world peace	21 <sup>st</sup> century skills of the concept of the Partnership for 21 <sup>st</sup> Century Skills [online] Retrieved from: <a href="http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf">http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf</a>
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<p>Omnes – to educate all human beings without discrimination (the aim)</p> <p>School for all – provide education for all humans and in every age/long life learning</p> <p>You have to learn from childhood and last a lifetime.</p> <p>Life long self-regulated learning/Studying (Pampaedia, p. 79).</p>	<p><i>Every 21<sup>st</sup> century skills implementation requires the development of key academic subject knowledge and understanding among all students.</i></p> <p>Flexibility &amp; Adaptability</p> <p>Initiative &amp; Self Direction</p> <p>Social &amp; Cross-Cultural Skills</p> <p>Cross-cultural Understanding</p> <p>Across Diverse Ethnic, Knowledge and Organizational Cultures</p> <p>Respect cultural differences and work effectively with people from a range of social and cultural backgrounds</p> <p>Respond open-mindedly to different ideas and values</p> <p>Leverage social and cultural differences to create new ideas and increase both innovation and quality of work</p>
<p>Omnia – in everything important for human life (the content)</p> <p>Teachers of all: enlightened, peaceful, faithful and holy, pious, honest, dignified, industrious, diligent, industrious, clever – harmony to think – to speak – to do, teach all things with a view to teach something new.</p>	<p><i>Within the context of key knowledge instruction, students must also learn the essential skills for success in today's world, such as critical thinking, problem solving, communication and collaboration.</i></p> <p><i>Use interpersonal and problem-solving skills to influence and guide others toward a goal</i></p> <p><i>Leverage strengths of others to accomplish a common goal</i></p> <p><i>Inspire others to reach their very best via example and selflessness</i></p> <p><i>Demonstrate integrity and ethical behavior in using influence and power</i></p> <p><i>Be Responsible to Others</i></p> <p><i>Act responsibly with the interests of the larger community in mind</i></p> <p>Interact Effectively with Others</p> <p>Know when it is appropriate to listen and when to speak</p> <p>Conduct themselves in a respectable, professional manner</p> <p>Work Effectively in Diverse Teams</p>
<p>Omnino – in the universal way of all-round development of a human being, both individually and socially (the method and methodology)</p> <p>To learn everything thoroughly and in context</p> <p>Books of all / idea of multimedia (Pansophia), written by a new method and only with important things.</p>	<p>When a school or district builds on this foundation, combining the entire Framework with the necessary support systems-standards, assessments, curriculum and instruction, professional development and learning environments – students are more engaged in the learning process and graduate better prepared to thrive in today's global economy.</p>

Table 3

*Comenius principles by Didactica magna/The Great Didactic (1633–1638), The Analytical Didactic (in Methodus linguarum novissima/ Newest Method of Languages, 1646), Opera didactica omnia (1630–1657), and 21<sup>st</sup> century skills*

<p>Comenius principles by The Great Didactic / Didactica magna (1633–1638), The Analytical Didactic (in <i>Methodus linguarum novissima</i>, 1646 <i>The Analytical Didactic</i>, forming part of his <i>Newest Method of Languages</i>) and <i>Opera didactica omnia</i> (1630 – 1657),</p>	<p>21<sup>st</sup> century skills of the concept of the Partnership for 21<sup>st</sup> Century Skills [online] Retrieved from: <a href="http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf">http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf</a></p>
<p>Education in harmony with nature (Didactica magna, chap. XVII) To learn fast, friendly and thoroughly by examples, precepts/ theorems, instructions Realism and universalism – harmonic knowledge of all things necessary on the basis of a set objective – lessons based on real knowledge</p> <p>The principle of adequacy – with respect to the natural development of a child, with respect to age and individuality of each student. Freedom and education of an individual objective approach, illustrative teaching. Didactic clarity – requirement of direct sensuous learning about reality – the “golden principle” of didactics. Let propositions be modest in number, clear in meaning, general in truthfulness so that they can be safe to trust. Finally, let exercises be attached to demonstration in order to enable to live its note. Let them learn words only in connection with things. (Didactica magna, chap. XIX, no. 45) Let not taught anything only through narration, everything through sensual demonstration and sensible.</p>	<p><i>Demonstrate knowledge and understanding of the environment and the circumstances and conditions affecting it, particularly as relates to air, climate, land, food, energy, water and ecosystems</i></p> <p><i>Adapt to change</i> <i>Adapt to varied roles, jobs responsibilities, schedules and context</i> <i>Work effectively in a climate of ambiguity and changing priorities</i> <i>Be flexible</i> <i>Incorporate feedback effectively</i> <i>Deal positively with praise, setbacks and criticism</i> <i>Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments.</i></p> <p><i>Understand both how and why media messages are constructed, and for what purposes</i></p> <p><i>Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors</i></p> <p><i>Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media</i></p> <p>New Knowledge Creation, “Best Fit” Design Solutions, Artful Storytelling, etc.</p>

<p>The gradual building of knowledge from the ground up, full of contextual understanding, learning in context and with the unveiling of internal causes on the whole.</p> <p>Everything through the students' own and continual practice.</p> <p>Constant repetition of the learned stuff.</p>	<p><i>Collaborate with others</i></p> <p><i>Demonstrate ability to work effectively and respectfully with diverse teams</i></p> <p><i>Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal</i></p> <p><i>Assume shared responsibility for collaborative work, and value the individual contributions made by each team member</i></p>
<p>Thorough basic learning, learning to be started slowly and carefully.</p> <p>The pupil has to understand everything from the very start and correctly, it is necessary to correct wrong ideas, to correct mistakes immediately and thoroughly.</p> <p>Discipline is necessary for learning</p>	<p><i>Solve problems</i></p> <p><i>Solve different kinds of non-familiar problems in both conventional and innovative ways</i></p> <p><i>Identify and ask significant questions that clarify various points of view and lead to better solutions</i></p>
<p>The teacher must know what he has to teach others, must have a gift for teaching and patience, be active and diligent.</p> <p>Each student is a teacher at the same time</p> <p>Learning, passing from one to another, is a bond between the teacher and the student.</p>	<p><i>Communicate clearly</i></p> <p><i>Articulate thoughts and ideas effectively using oral, written and verbal communication skills in a variety of forms and contexts</i></p> <p><i>Listen to decipher the meaning, including knowledge, values, attitudes and intentions</i></p> <p><i>Use communication for a variety of purposes (e.g. to inform, instruct, motivate and persuade)</i></p> <p><i>Use multiple media and technology, and know how to assess their effectiveness a priori as well as an assessment of their impact</i></p> <p><i>Communicate effectively in different environments (including multi-lingual)</i></p>
<p>Method of language teaching: to teach any language through images related to sensory perception</p> <p>Realism – lessons based on real knowledge (The Gate of Languages Unlocked)</p> <p>Let education cultivate the reason in a man, language, hand for reasonable viewing, reflecting, doing of all useful things.</p>	<p><i>Understanding other nations and cultures, including the use of non-English languages</i></p>
<p>The principle motivation headed Comenius off from the interests of the students, develop interests, active thinking processes and practical activities. It is one of the most important prerequisites for successful education today.</p>	<p><i>Use a wide range of idea creation techniques (such as brainstorming)</i></p> <p><i>Create new and worthwhile ideas (both incremental and radical concepts)</i></p> <p><i>Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts</i></p>
<p>The principle of activity – pupils should acquire knowledge through their own experience, use them in practice.</p>	<p><i>Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas</i></p> <p><i>View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes</i></p> <p><i>Cooperation, Compromise, Consensus, Community-building, etc.</i></p>

<p>Progressiveness – from the simplest to the more complex and familiar – the analytic, synthetic, syncretic methods. Need to always repeat. The necessity of permanent repetition. The virtue of a rule is being short in words, clear in meaning and filled with truth.</p>	<p><i>Reason effectively</i> Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation <i>Use systems thinking</i> Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems <i>Make judgments and decisions</i> Effectively analyze and evaluate evidence, arguments, claims and beliefs Analyze and evaluate major alternative points of view Synthesize and make connections between information and arguments</p> <p>Critical thinking and doing Problem-solving, Research, Analysis, Project Management, etc.</p>
<p>Logical sequence and orderliness (Analytic didactic)</p> <p>The systematic principle, still related to the requirement of “chaining” of the entire content It shows deep interconnection of information, not only within particular subjects but also interdisciplinary.</p>	<p><i>Think creatively</i> Use a wide range of idea creation techniques (such as brainstorming) Create new and worthwhile ideas (both incremental and radical concepts) Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts Access and evaluate information Access information efficiently (time) and effectively (sources) Evaluate information critically and competently Use and manage information Use information accurately and creatively for the issue or problem at hand Manage the flow of information from a wide variety of sources Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information</p>



<p>Connection between theory and practice, education through work, connection of thinking, speech and hand work. Introduce everything into practice (sapere, agere, loqui, Orbis sensualium pictus, p. 22).</p>	<p><i>Learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts.</i></p> <p><i>Develop, implement and communicate new ideas to others effectively. Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work.</i></p> <p><i>Implement innovations</i> <i>Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur</i></p> <p>Problem-solving, Research, Analysis, Project Management, etc. From the simplest to the more complex and familiar, continuously, interconnectin of school and practice, illustrativeness</p> <p>Be self-directed learners Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise Demonstrate initiative to advance skill levels towards a professional level Demonstrate commitment to learning as a lifelong process Reflect critically on past experiences in order to inform future progress.</p> <p>Demonstrate additional attributes associated with producing high quality products including the abilities to:</p> <ul style="list-style-type: none"> <li>– Work positively and ethically</li> <li>– Manage time and projects effectively</li> <li>– Multi-task</li> <li>– Participate actively, as well as be reliable and punctual</li> <li>– Present oneself professionally and with proper etiquette</li> <li>– Collaborate and cooperate effectively with teams</li> <li>– Respect and appreciate team diversity</li> <li>– Be accountable for results</li> </ul>
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New knowledge to be immediately used and shared with others.	<b>PRODUCTIVITY AND ACCOUNTABILITY</b> Manage projects Set and meet goals, even in the face of obstacles and competing pressure Prioritize, plan and manage work to achieve the intended result Produce results New Knowledge Creation, "Best Fit" Design Solutions, Artful Storytelling, etc.
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The genius of the educational work of Comenius is especially evident in ideas of lifelong learning – „long life education“ (in Pampaedia – on education), co-operation and communication with parents, connecting school and life / practice.

Comenius' work is an important source of guidance and inspiration for every teacher and educator. It is no accident his work around the world is still studied in depth.

Comenius' pedagogy is a platform for education reform pedagogy, which affects traditional teachings through its principles, such as emphasis on students' independent work, teachers' focus on students' needs, activity, freedom, transferring responsibility for decision making on the way to learning/acquisition of knowledge from teachers to students, i. e. the requirement of self-organized/self-regulated teaching/learning.

In relation to the contemporary concept of the learning process, which follows from the theory of pedagogical constructivism, it is self-directed learning where teachers help students by using methods such as mentoring, tutoring or coaching. The intensity and the level of education reform pedagogy their assistance depends on the age of students – first you need to show children the way to learning, to support their curiosity, to teach them how to learn using modern means such as ICT, visually attractive materials and adequate methods – mooc, blenden learning ...

The paradigm in the relationship between teacher and pupil is changing. The pupil is understood as a person who governs his/her education actively and individually to some extent. The teacher/educator gets into the role of guide, tutor or mentor.

Students can acquire the 21st century skills through formal, non-formal or informal education.

What is also important for successful education is *soft skills* related to emotional and social intelligence and involved in social interactions. It is about capacity for particular behavior by means of which individuals present themselves to their surroundings. Unlike so-called hard skills, a set of professional skills that are specific and related to a particular field, soft skills can be considered s set of diverse means and methods of acquiring and developing professional skills. Soft skills are also one of the signs of emotional intelligence. "People whose soft skills are developed to a large extent, are considered to be emotionally intelligent" (Peters-Kühlinger 2007, 14). It is e.g. willing-

ness to cooperate, the art of efficient communication, healthy self-esteem and more... These skills can also be described as **social competences**.

The concept of entrepreneurial teachers' preparation based on supporting their activity, creativity and flexibility of Problem-solving is coming to the foreground.

If the position of teachers in education is understood as a role of a learning process manager, we may be inspired by a list of ten soft skills management, most important for management:

1. Excellent work ethic – motivation to carry out their work dutifully and in the best possible way.
2. Positive attitude to life – optimism, emitting positive energy and goodwill.
3. Good communication skills – effort to be a good speaker and listener, to be able to articulate their wishes and needs clearly and concisely.
4. Ability to manage time well and wisely (Time Management), be able to prioritize.
5. Ability to tackle and solve problems. To be able to determine the order of tasks and work on various projects simultaneously.
6. Ability to work with others in the team and, if necessary, take the leading role.
7. Being self-confident, believing in one's ability to perform the chosen work, arousing a sense of calm in other colleagues and trust them, to be able to ask questions and contribute with one's own ideas
8. Ability to accept criticism and learn from it. To behave professionally, to be led and to continue to learn.
9. To be flexible and be able to adapt oneself (adjust) to new situations and challenges. To be able to accept new ideas.
10. To manage stress and work well under pressure (cfr. Lorenz 2009).

A similar list of the most important soft skills is given by Peters-Kühlinger and Friedel (2007, p. 17):

1. Communication skills (competences)
2. Second self-confidence,
3. Empathy,
4. Ability to teamwork
5. Ability to accept criticism and to criticize effectively,
6. Analytical thinking,
7. Credibility
8. Discipline and self-control,
9. Curiosity,
10. Ability to manage conflicts,
11. Assertiveness.

### **A teacher can also be seen as an “architect” in his/her class, he/she:**

- Defines highly-effective 21st century teaching
- Connects the isolated parts of instructional design and delivery into a coherent whole
- Supports teachers writing a blended curriculum to the specs of the Conceptual Age
- Provides a lens for how we think about 21st century learning and flipped teaching
- Supports the implementation of digital learning systems into classroom practice
- Creates structures for organizing, managing, storing and collaborating with digital content
- Offers practical, useful tools for teachers to design and deliver highly-effective instruction
- Identifies methods for increasing and measuring student interest and success.

(see <https://modernteacher.com/teacher-as-architect/>  
<http://digitalliteracy.us/21st-century-learning/>)

It is family that is primarily responsible for education and successful socialization of a pupil; school and teachers are then responsible for his formal education and significantly contribute to his/her secondary socialization.

The future is uncertain but to some extent it is possible to predict the social, political, or economic development as well as the development of social and natural sciences, and informatics and technology.

The common task of schools, families and the community is then to prepare children for life as successful active person/citizen. Thus, to develop and cultivate flexibility and resilience of the child to be able to respond adequately to diverse life situations and social changes brought by the development of technology and science, and related differentiation of society. The point is to find an identity and a satisfactory way of life that corresponds with the aim of achieving high quality of life.

If the teacher/school is able to form a picture of the world with respect to universally accepted ethical, moral and democratic principles, it has to be communicated to and shared with every individual for the benefit of all people by all available means (see Comenius and his works *Pansofia*, *Pampaedia*).

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