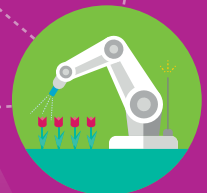


The Book of Trends in Education 2.0



MODERN EDUCATION – WHAT IS IT LIKE?

OPEN & CHECK

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INTRODUCTION

The role of education is to inspire. It should help students recognise their uniqueness and overcome difficulties so that they can fulfil their own potential. It should foster critical thinking and creativity. It should empower students to develop the skills needed in today's world.

But what's it like in reality? What is modern education like? All over the world we hear disturbing news about schools that depart from the real world, curricula that are overloaded with information, schools that destroy the pleasure that comes from learning new things, or youngsters who leave school without any skills, knowledge or competences critical for a successful life. This sounds troubling. On the other hand, we can also see improvements, often grassroots alternative approaches evolving, more and more research devoted to optimising education – we can see that people simply crave change. Another thing, somewhat new in this picture, is the rapid and constant technological development that creates both great opportunities and challenges for schools and for the whole system. Let us help you understand these new circumstances.

Dear Reader, you are holding the second, enhanced edition of “[The Book of Trends in Education 2.0](#)” that provides the answer to a question: what is modern education like? This time we went one step further and created the publication in cooperation with educators, teachers and practitioners, people who approach education professionally both from an academic and practical perspective. They follow the trends described on the following pages in their everyday work thus altering the face of education itself. They decided to share their experience, accomplishments and conclusions by creating case studies that are an integral part of each chapter. We hope that in combination with the comprehensive description of the trends, these real-life examples will give you a broader perspective and a chance to understand what is truly important in the learning process.

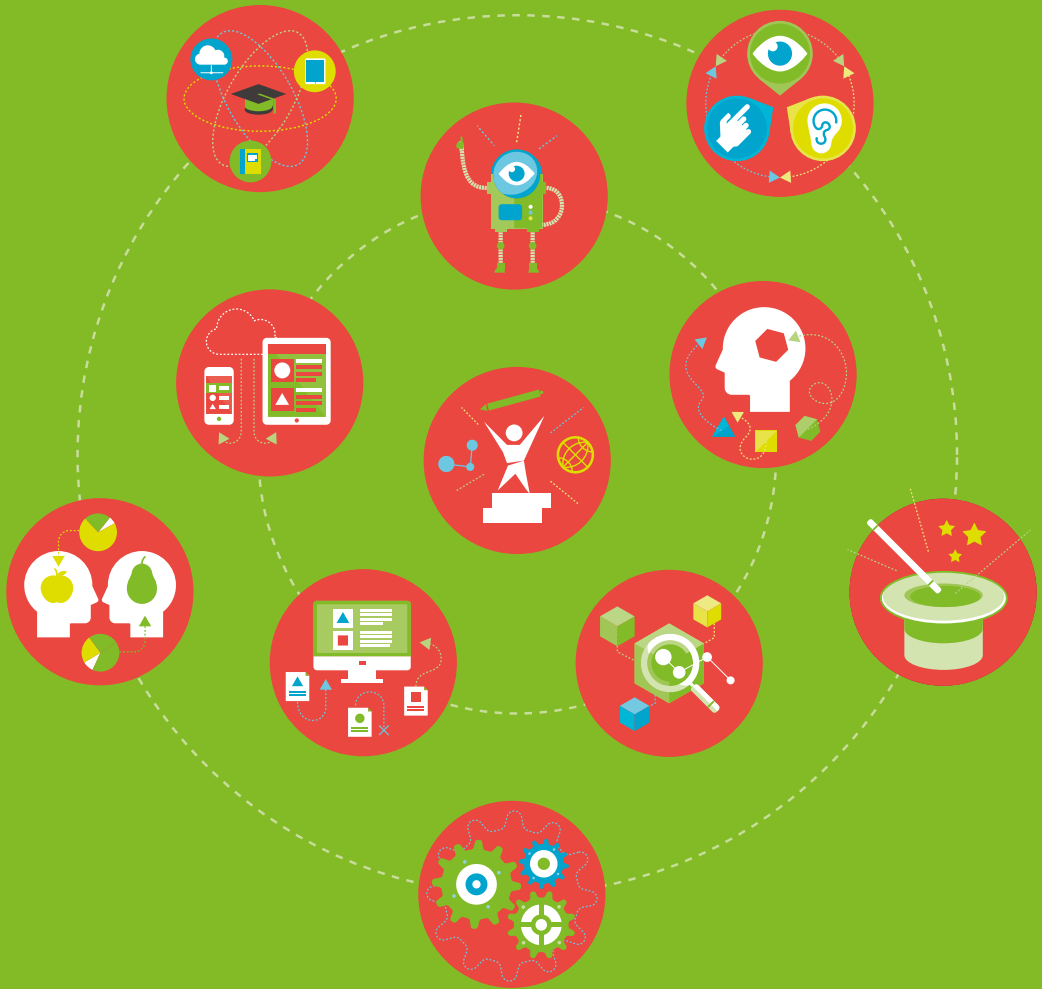
This understanding is crucial for the implementation of any changes as education is a very delicate area with no place for lighthearted experimentation. Problems cannot be solved by a single method. There are no quick fixes. People tend to think that what has been successful in one place can be easily reproduced in the exact same way somewhere else, a place that is sometimes completely different. We believe that this is not possible. You cannot turn every country into Finland. But you can understand what has been the core of Finland's success and then filter it through your conditions and start from there. A perfect solution will be a mixture of various trends and approaches that suit a particular environment, particular needs and people. However, to be able to reach it, you need knowledge.

This publication offers you the chance to get to know the trends in today's education. It enables a comprehensive review and can also serve as an inspiration or a quick reference. It will help you diagnose the problems, see the big picture, understand its complexities and think of remedies. It will show you the examples of successful implementations. We have focused on the most important aspects of each trend, also providing the background picture, the pros and cons, examples and some practice to show you the essence and the value (or dangers) of particular approaches.

The educational process needs to be correlated more closely with human nature, with our individual needs and individual level of development. It should help learners in the development of their metalearning skills, self-awareness, self-decision-making and independence. Being aware of the differences between individuals can often provide the necessary grounds for tolerance that in itself will improve the approach. Today we have more and more information on the functioning of our brain, its stimuli and elaboration processes – data that could bring crucial advantages when implemented in the learning process. We know that humans enjoy overcoming obstacles and, when challenged, they often thrive looking for patterns and searching for answers. But this is the case only if the challenge is interesting for them, meets their needs or is simply intriguing. We like being active and when the activity is fulfilling, learning becomes fun. We also believe that, contrary to what some might think, the position of the teacher is still of the highest importance regardless of modern technology. On the other hand, the power of technology should not be underestimated as it provides a great enhancement and support for the learning process, provided that it is used properly, with the nature of the tool in mind.

This edition of "**The Book of Trends in Education 2.0**" embraces all the complexities of modern education. We hope that it will ease the burden of having to search for the right answers in different places and ensure the space and guidance for constructing your own path and conditions for successful teaching and learning.

So, what is modern education like? Let's see...



Alina Guzik

MODERN EDUCATION IS PERSONAL

MODERN EDUCATION IS PERSONAL

It's been some time now since the subject of personalisation began to arouse great interest in the world of education. Many anticipate that it will put a stamp on the future of education systems and direct the development of educational content publishing. Personalisation is based on self-awareness, an independent journey along an educational path selected by the learners themselves. It's inextricably linked with highly-developed learning skills, assuming a process-based approach and respecting the individual learning style of each student. Enriched with technological achievements such as mobile and adaptive education along with big data, it can change the education that we know today.

Personalisation puts the student in the centre of the educational universe and gives them the freedom to decide what, how and when to learn. Although fair, this assumption may cause concern. We should remember that, contrary to what it might seem, personalisation does not minimize the significance of a teacher. In fact, it's just the opposite. Teachers have many more responsibilities than they used to and, thanks to their work, students not only know more, but they also become more independent and happier.

What is personalisation about and how is it different from the related concept of individualisation? The answers to these questions are at hand.

find
the differences



DIFFERENTIATION



students
in groups



whole class
teaching



different tools
for groups



differentiated
instruction for groups



teacher
in the centre



the same curriculum
objectives for everyone

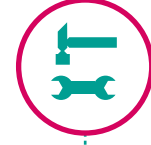
INDIVIDUALISATION



students
as individuals



one-to-one
teaching



different tools
for individuals



differentiated instruction
for individuals



teacher
in the centre

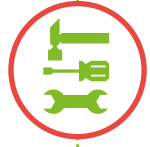


the same curriculum
objectives for everyone
+ specific for individuals

PERSONALISATION



follows their own
learning path



chooses learning
methods



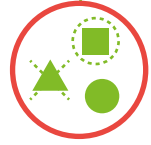
student
in the centre



practices
metalearning



identifies their own
learning goals



decides what, where
and how to learn



analyses their own
learning preferences



needs technology



needs a teacher
as a mentor

I

Modern education is personal

1. Personalisation in Education
2. Learning to Learn
3. Process-Oriented Learning
4. Individual Learning Style
5. Student-Centred Learning
6. Personal Learning Environment
7. Analytics and Big Data
8. Adaptive Learning
9. Mobile Learning
10. Virtual Tutor

Tips & tricks to make teaching & learning personal

1. Case Study: Finding a way to incorporate the use of tablets during classes with elementary school third graders
2. Case Study: Education of ill children as an illustration of trends associated with personalisation
3. Case Study: A tablet in the classroom – creating a mobile learning environment



I. Modern education is personal

PERSONALISATION IN EDUCATION

PERSONALISATION IN EDUCATION

› Your future is in your hands ‹

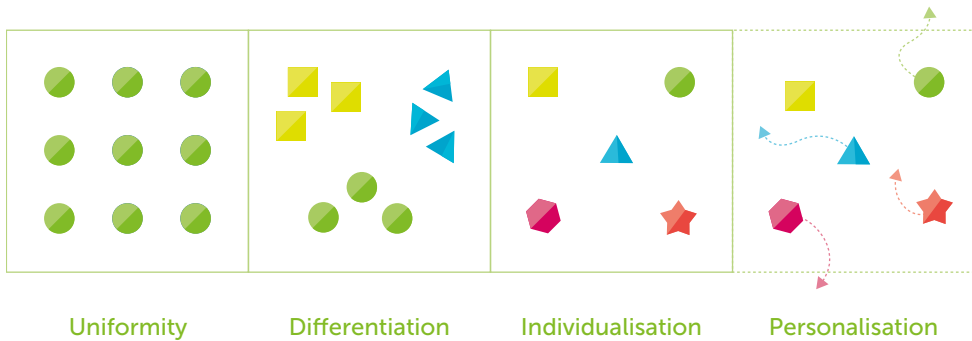
Related Terms

Person-centred thinking, personalised learning, individualisation, differentiation, student-centred learning, personal portfolio, student-driven learning path, individual learning path, student-driven participation, flexible program delivery, self-initiation, self-direction, self-prioritisation

Personalisation first appeared in education around 1905 when Helen Parkhurst came up with the Dalton Plan. At some point of her life she was faced with the challenge of teaching a few classes at the same time. To organise her work, she divided the classroom into a few zones, each of which was dedicated to a different school subject. From that moment on, the children could work at school on their own, at their own pace and with an emphasis on cooperation with their classmates. Helen came up with the principle of an individual approach to the evaluation of results. Moreover, she posed a very important question which makes up the core of the contemporary idea of personalisation: “What can we do to encourage children to seize the educational initiative?”

The concept of “personalisation” was made popular in 1970 by a Spanish pedagogue Víctor García Hoz. Since then, the word has gained numerous definitions. Some of them focus on the idea of adjusting the content to the individual needs of the student. Others emphasize the maximum exploitation of the student’s potential. Sir Ken Robinson, a guru in the world of education, described the phenomenon in the following way: “Personalised learning, to me, is the process of contouring learning to the individuals that you’re dealing with, recognising that we all have different strengths and weaknesses, different interests [and] different ways of learning”. Personalisation is sometimes wrongly identified with other concepts such as individualisation or differentiation. Such simplification might have contributed to the fact that today there’s no clear or well-established definition of personalisation. In order to structure our knowledge, let’s examine the teaching and learning process from the evolutionary perspective. In the simplest case, all students are treated in the same way – they are served the same content, the same books and student books. Everyone is evaluated according to a single scale and the same criteria. This approach was used at schools around the world for decades.

However, at some point, it was noticed that students are not the same and they should be classified into homogenous groups (differentiation). An example is dividing students into average, talented and problematic ones and preparing materials for student books and exercise books according to the three levels of difficulty.



Individualisation in education assumes that every student is different and needs a unique approach. All activities aimed at the student's development are a result of external stimulation and their aim is to enable the student to master the enforced curriculum. An example of individualisation is inclusive education whose goal is to give equal chances to all children. The student's educational process is individualised by a third party, for example a teacher, a parent or the system.

Personalisation, on the other hand, assumes that the students themselves arrange, realise and modify the educational process. It's the child that decides which way they want to go and it makes no difference if they follow the adopted curriculum or not. Personalisation refers to educational awareness, the ability to learn on our own and the selection of the things we want to learn. Personalised education does not end at school but goes beyond the education system in its broadest sense. It concerns our passions, social life, personal development and experiences. It's the only way to exploit the educational potential to the fullest. A teacher is an essential presence in the personalisation process. They show the students what self-awareness is, present the tools, give tips and show the right way if students get lost. But the core of personalisation lies within ourselves. We are the only ones who can personalise our own education – nobody else can do it for us.

Drivers

- Unsuccessful education approaching each student in the same way
- Inability to set and reach goals
- Desire to rise up to the challenges of the 21st century
- Analysis of the causes of educational failures

Advantages

- Increasing significance and responsibility of the student in the educational process
- Making students realise that they can influence their results and educational future
- Unlocking students' true potential for a harmonious and happy life

Challenges

- Lack of the tools and knowledge necessary to support the personalisation process
- High costs of creating many variations of educational materials
- Limited possibilities of predicting and managing students' education

Examples

- UNESCO Institute for Information Technologies in Education – policy brief on personalised learning <http://iite.unesco.org/pics/publications/en/files/3214716.pdf>
- Pathways to Personalized Learning. A research report from the centre for digital education http://www.brothercloud.com/pdf/OmniJoin_Personalized_Learning.pdf
- An Investigation of Personalised Learning. Approaches used by Schools – University of Cambridge <http://www.education.gov.uk/publications/eOrderingDownload/RR843.pdf>
- <http://www.personalisingeducation.org>

Related Trends



Personal Learning Environment



Process-Oriented Learning



Learning to Learn



Student-Centred Learning



Edutainer



I. Modern education is personal

LEARNING TO LEARN

LEARNING TO LEARN

› Rule number one: learn how to teach yourself ‹

Related Terms

Meta learning, Self Regulatory Learning (SRL), neurodidactics, brain-friendly learning, metacognition, learning styles

Personalisation in education is primarily the process of helping the student become fully independent and self-aware while the fundamental role of the educational environment is to teach them how they can help themselves. This ability is a gift, useful not only at school but also in everyday life. The learning process can be easily observed, understood and shaped in such a way as to make it more efficient, pleasant and reliable. Meta learning and, as a consequence, self-regulatory learning (SRL) is based on metacognition, application of strategies, planning, monitoring and evaluation of personal progress and motivation to study. Self-regulation is simply the process of assuming control over our own behaviour, in particular our learning habits.

Unfortunately, contemporary schools pay little attention to learning methods. The instances of encouraging students to self-observe, apply mnemonics or develop their own learning techniques are scarce. Teachers focus on teaching their subjects – they don't really have time to help their students develop meta learning skills. It's hard to blame them as they are forced to follow the curriculum within a set period of time and that's the sole factor based on which their performance is assessed. Meta learning gave an opportunity to make a fortune to companies that offer courses in speed reading or effective studying and authors of self-help books who let you in on a secret that will change your entire life for only 10 Euros. But in a perfect world, the ability to learn should be the most fundamental and significant skill we acquire at school.

Meta learning can be considered from three angles. First, students are shown how to learn more. Second, they are shown how to learn more efficiently. And third, they are shown how to become better students. The first step to successful self-knowledge is the discovery of one's own cognitive strategy. Next comes the study of brain mechanisms, i.e. the assumptions of neurodidactics.

Self-awareness is largely based on analysis and deduction. Each successful and unsuccessful study attempt broadens our knowledge, for example, it shows us that the state of our mind and physical health can influence a successful learning process. Experience

shows that when we're hungry, sleepy or nervous, we're not able to focus. What's more, we notice that the choice of appropriate tools matters. As a consequence, students conclude that successful learning is not a result of an inborn talent, but develops with training and experience. They become motivated and see sense in their work, thinking "I failed not because I'm stupid, but because I used the wrong method". It's a huge relief for students who are finally freed from the stress they are normally forced to endure every day.

When you were a student, did you ever think about what you needed in order to learn successfully? Did you try different methods and techniques to find the perfect one for you? Did you analyse your educational failures to draw conclusions for the future? If the answer is yes, it means that you know and appreciate the value of developing your learning potential in the context of human capacities. There is nothing more important in the entire schooling system than raising the significance of meta learning. This is the skill that will enable students to solve the problems they encounter at school and in everyday life. Is there a more valuable gift that we could give to our students and ourselves?

Drivers

- Striving towards personalisation of the education process
- Increased emphasis on acquiring skills rather than theoretical knowledge
- Desire to prepare students for the challenges of the 21st century
- Need to make students more independent educationally

Challenges

- Need to train teachers and provide them with essential equipment and techniques
- In the present schooling system, meta learning would have to take place at the expense of regular classes and curriculum
- Need to convince the education specialists about the value and significance of meta learning

Advantages

- Teaching students skills that are useful not only at school
- Improving students' self-esteem
- Developing high-order thinking skills

Examples

- "A Framework for Facilitating Meta-Learning as Part of Subject Teaching" by Tara Winters for the University of Auckland
http://conference.pixel-online.net/foe2013/common/download/Paper_pdf/166-ITL28-FP-Winters-FOE2013.pdf
- Self-regulated learning at Wikipedia
http://en.wikipedia.org/wiki/Self-regulated_learning
- Study Guides and Strategies – an educational public service
<http://www.studygs.net/metacognition.htm>
- "Learning How to Learn: Powerful mental tools to help you master tough subjects" course at Coursera
<https://www.coursera.org/course/learning>
- "Learning to Learn" – a paper by Karl R. Wirth from Macalester College and Dexter Perkins from the University of North Dakota
<http://www.macalester.edu/academics/geology/wirth/learning.pdf>

Related Trends



Personal Learning Environment



Student-Centred Learning



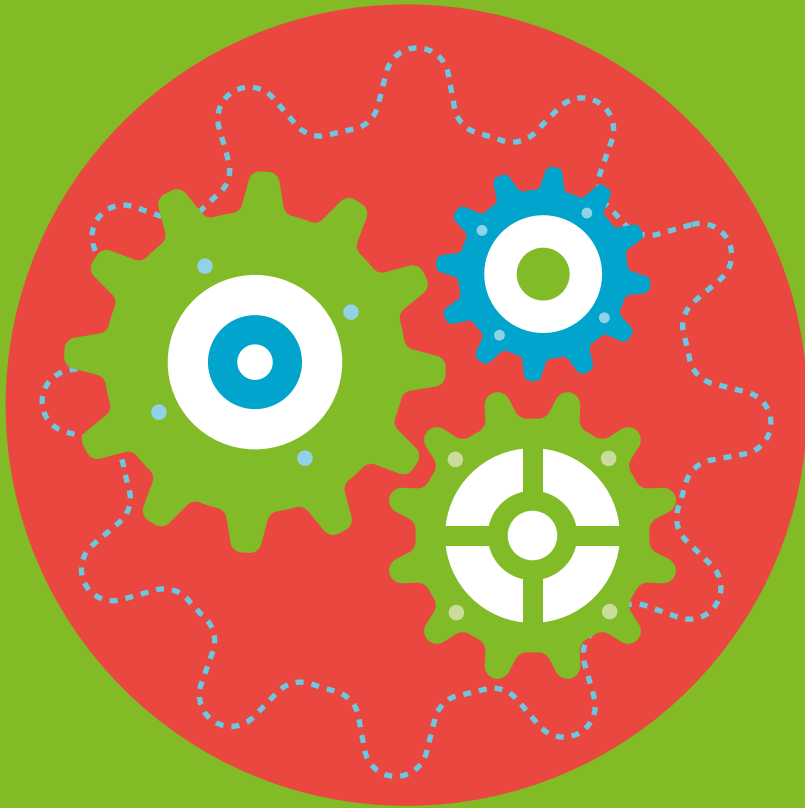
Edutainer



Individual Learning Style



Neurodidactics



II. Modern education is personal

PROCESS-ORIENTED LEARNING

PROCESS-ORIENTED LEARNING

› Learning is a way of life. Everyone follows their own way. ‹

Related Terms

POGIL, self-regulation process, external regulation process, learning to learn, process-based learning, instructional design, personal portfolio, process-oriented education, event-oriented education

Personalised education requires us to move the emphasis from isolated educational events to learning understood as a holistic process. Viewing students in light of their entire life, their full potential and needs, not only educational ones but also emotional and psychological, is a game-changer. But we have to devote a great deal of effort to understand this process and put it into practice. Effort on the part of a teacher who assumes the role of an analyst, strategist and instructor, and on the part of children who need to somehow look at themselves from the outside and understand the objective and the way they should follow. One bad mark or a bad day does not weigh against the overall educational success. The real key to success is to understand the context – and it takes a lot of time and dedication to discover the true story of each child.

This process-based approach provides a chance to move away from the culture of assessment, failures and making comparisons between students. It's an approach that eliminates the pressure and fear and prevents students' self-esteem from dropping. Being aware of the process is not equal to knowing that a child is placed at a given point on a scale from 1 to 5, but rather knowing that they're at some point of their educational path. They have come a long way and are still heading towards the finish line even if they sometimes get lost along the way. There are no failures in the process-oriented education. There is only feedback that provides information on whether or not a given solution is correct. It's an indicator and a lever for progress and personal development.

Literature lists numerous examples of the use of this idea in practice. Researchers Jan Vermut and Lieven Verschaffel think that process-oriented learning focuses its efforts on the methods of building knowledge and skills and the possibilities of their later use. The POGIL (Process-Oriented Guided Inquiry Learning) method, devised in 1994 at chemistry educational facilities and currently used on a wider scale, represents a similar approach.

POGIL is a special environment where students actively engage in the process of learning new material. There are self-governing research groups that act in accordance with the 5E model (Engage, Explore, Explain, Extend and Evaluate) developed by Roger Bybee from the Educational Centre Team of Biological Science Curriculum Study (BSCS) in the United States.

Process-oriented education, however, goes beyond POGIL or knowledge acquisition schemes. Learning is something more than school and absorbing new information. It also refers to passions, ways of solving your own problems, self-perception, professional life, functioning in a family and many other context-based factors. And in the centre of this educational universe there is always a human being. To be able to understand them better we should register and analyse their unique learning process. Technology is of some help here. Without it, it would be very difficult to capture and monitor this complex mechanism.

Drivers

- Understanding the educational needs of each child
- Ineffectiveness of the approach focused on isolated educational events
- Context which makes fair assessment of students difficult

Advantages

- Mistakes perceived as feedback not as a failure
- Stress-free education without emotional pressure
- Individual approach to each student
- The right way to become self-aware and personalise education

Challenges

- Lack of tools supporting the analysis of the process
- Difficulties in grasping the entire complex learning process

Examples

- Process Oriented Guided Inquiry Learning project <http://www.pogil.org>
- New Learning: Robert-Jan Simons, Jos van der Linden, Tom Duffy
ISBN: 978-0-7923-6296-8
<http://www.amazon.com/New-Learning-Robert-Jan-Simons/dp/0792362969>
- A process oriented approach to learning-
<http://files.eric.ed.gov/fulltext/EJ719906.pdf>

 *Related Trends*



Personalisation in Education



Student-Centred Learning



Learning to Learn



Analytics and Big Data



I. Modern education is personal

INDIVIDUAL LEARNING STYLE

INDIVIDUAL LEARNING STYLE

› Stylish education ‹

Related Terms

Sensory modality, perception strategy, theory of multiple intelligence, laterality, cognitive styles, executive function theory, self-regulatory learning, auditory, visual, kinaesthetic, tactile

Personalisation in education respects the uniqueness of each student. Each and every one of us discovers the external world using our senses and, thanks to the plasticity of our brains, we are able to receive and interpret stimuli in an appropriate manner. And although our learning mechanisms are generally similar, there are also many differences. Some prefer to study in the evening or at night, while others are early birds whose intellectual activity is at its best in the morning. But not only the time of day is significant. The sex, age, personality type, thinking style and the type of motivation that stimulates a given person best all count as well. The number of variables that determine whether we learn fast and efficiently or, to the contrary, we find it hard and difficult, is immense. Does an average student know at least a few of them and are they able to control them? Surely, for some students the answer is yes, even if they do it subconsciously. This is evidenced by the appearance of school desks – some of them spotlessly clean, others buried in highlighters, pens and sticky notes. All this in order to learn according to one's individual style and make the process more pleasant and successful.

An individual learning style is nothing more than a series of theories on the different preferences in the way information is acquired and processed. The term first appeared in the 1970s and quickly left a mark in the educational environment. Some also quickly identified it with the phenomenon of cognitive strategy (otherwise known as modality type), i.e. the assumption that people are divided into visual learners, auditory learners and kinaesthetic learners, or sometimes tactile learners who best acquire knowledge associated with emotions and external world.

But a learning style is a wider concept than the modality. The scope of factors and variables that influence the learning process is constantly growing. It doesn't change the fact that to know when and how to study successfully is a valuable gift. It enables us to adjust

the situation and materials to our needs so that we can learn faster and more efficiently. We can help students understand why sometimes it's so difficult to study and other times it's much easier.

Knowing your own learning style helps in building high self-esteem. It turns out that a student who is a kinaesthetic learner ceases to think of themselves as someone hyperactive, stupid or simply worse than others. They start to understand that they need movement to absorb information and sitting motionless for a few hours is not in their nature. This type of student will be able to focus best when they're moving. And today everyone's starting to understand that there is nothing wrong with that.

The people behind the design of the educational system and school reality are faced with a big challenge. How can we help children who need visual stimuli if a lesson assumes the form of a lecture? What is the successful way to design didactic materials adjusted to the needs of people with various learning styles? What tools should we use to identify the various needs of students and how to help them become aware of the specifics of their own learning style?

Over the last few years, learning styles have been subject to a lot of criticism. Some say that there is no proof that such styles exist and point out the lack of research that would confirm the effectiveness of the approach at schools. Others are alarmed that labelling students may bring more harm than good. However, there is no denying the fact that each and every one of us is an individual being and our learning style is one of the components of such individuality.

Each, even the slightest, attempt to understand the individual needs of students and encourage them to get to know themselves better is valuable.

Drivers

- Students' poor learning outcomes
- Problems with concentration during learning
- Analysis of the reasons for students' difficulties in learning

Advantages

- Better learning outcomes
- Improving students' self-esteem
- Taking actions aimed at personalising the educational process

Challenges

- Adequate examination of learning styles
- Grasping the complex phenomenon
- Unfair labelling of students
- Obtaining materials suitable for persons with a given learning style
- Lack of research on the effectiveness of the approach

Examples

- ClassMapp – product by Young Digital Planet
- Learning Style Inventory (LSI)
<http://www.humanesources.com/products/program/the-learning-style-inventory/>
- Edu & You – analysis of learning styles
www.eduyou.pl/analiza-stylu-uczenia-sie
- learning-styles-online.com provides free information and tools to help you understand and use learning styles effectively
- P.E.T. Learning Styles Solution
<http://www.learningstyles.ca/indexfull.asp>
- Learning and teaching styles in engineering education <http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/LS-1988.pdf>

Related Trends



Personalisation in Education



Personal Learning Environment



Student-Centred Learning



Learning to Learn



Edutainer



Neurodidactics



I. Modern education is personal

STUDENT-CENTRED LEARNING

STUDENT-CENTRED LEARNING

> The pupil in the centre of the educational universe <

Related Terms

Learner-centeredness, student-centred learning environment, child-centred learning, student-centred classroom

Student-centred learning emphasises the individual needs of every child. In this learning model, other participants of the educational process such as teachers, parents and administrative staff play a supporting role. The student is the most important element – along with their abilities, weak points and preferred learning style. Equally important are the child's interests and their dynamically evolving social, intellectual and psychological needs. After decades during which the teacher-centred system prevailed, the time has finally come to acknowledge that it is the child who is the primary participant in the educational process.

The implementation of a student-centred method may take various forms. It's sometimes said that the child alone must decide on what and how they learn, and what the evaluation and reward system should look like. Others see this method as a way of transforming students' attitudes towards school, from passive to active, which is supported and assisted. These issues have been discussed in the works of such eminent thinkers as John Dewey, Jean Piaget and Lev Vygotsky.

The problem with the implementation of the student-centred method is the difficulty in its practical application, often reported by teachers. One of the reasons for this is the amount of time required to approach each student in a personalised way. The evaluation of progress and the implementation of standards imposed by the education system are not easy, either. Despite all that, delivering student-centred learning and its objectives is not just a suggestion but also an obligation.

Drivers

- Students acquire knowledge in various ways and styles
- Level of students' skills and abilities is not homogeneous
- Social changes force new requirements for the qualifications of students and graduates

Advantages

For students:

- Better learning results and mental well-being
- Increased active participation in classes
- Ideas and questions are welcomed and appreciated
- Treatment of students as partners in their educational journey
- Taking responsibility for one's learning
- Encouraging personal comments and, consequently, developing creativity
- Defining one's own opinions through conversations, listening, writing, reading and reflecting on content, terms, problems and concerns
- Students become sources of knowledge for each other
- Learning the ways of acquiring information

For teachers:

- More effective traditional work

Challenges

- Teachers may cease to feel responsible for learning results
- It is time-consuming
- Method can be difficult to apply in the early stages of education
- Difficulty with standard evaluation of students
- Problems with organising group work

Examples

- Education World site – an online resource for teachers, administrators and school staff
http://www.educationworld.com/a_curr/voice/voice117.shtml
- Faculty Focus site by Magna Publications
<http://www.facultyfocus.com/articles/effective-teaching-strategies/the-benefits-of-making-the-shift-to-student-centered-teaching/>
- "What makes student-centred learning?" by dr. Susan Sample from the University of Pacific <http://www.youtube.com/watch?v=ya0IK3yuuyg>

Related Trends



Personalisation in Education



Process-Oriented Learning



Personal Learning Environment



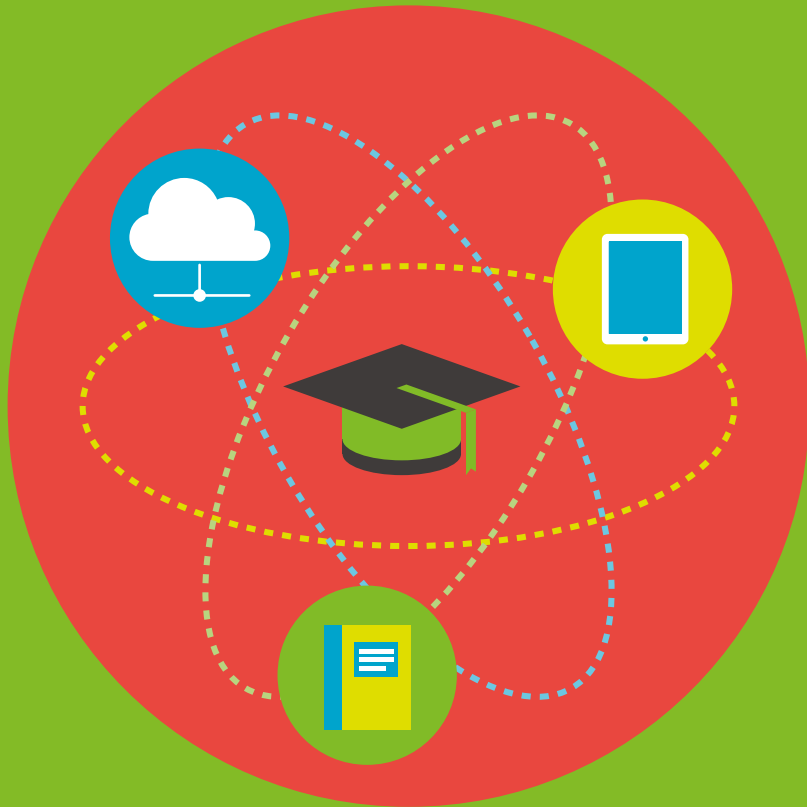
Adaptive Learning



Edutainer



Neurodidactics



I. Modern education is personal

PERSONAL LEARNING ENVIRONMENT

PERSONAL LEARNING ENVIRONMENT

› Your own, cosy and safe, educational world ‹

Related Terms

Personal learning, virtual learning environment (VLE), informal learning, PLE, blended learning, personal learning network, personal portfolio, cloud-based learning, e-portfolio, lifelong learning

Personalisation in education requires the student to create their own unique learning environment with all tools and materials that help them learn in an effective and fun way. Some students will include their favourite pens and pencils, hot tea, a favourite notepad or perhaps selected online tools. Research conducted by Young Digital Planet with the participation of middle school and secondary school students showed that students are more willing to learn in the evenings. Some students need music while others prefer absolute silence. The list of objects and tools is exceptionally long and interesting. Did you know that many people require the company of their beloved pet to effectively assimilate knowledge?

The most important feature of the personal learning universe is the fact that the learner chooses the materials, plans their education, compiles subjects and sources, thus having full control over what, when and how they learn. They select the information and decide what's important and interesting, what to look into further and what to omit. In other words – it's an excellent solution for the independent learner.

What resources make up the personal learning environment? Here are just a few:

- The Internet – news websites, educational websites, blogs, RSS channels, all types of social media: Facebook, Twitter, Google +, LinkedIn, YouTube, Vimeo, Instagram, Flickr, newsletters, VoIP such as Skype, and other communicators, social bookmarking sites, e.g. delicious.com
- Telephone – text messages, photos, videos, audio recordings
- “Offline” sources – e.g. interactions with family and friends, teachers and other people
- Radio and television

It’s impossible to define a complete list of sources. Each of us has our own collection and a unique personal educational universe.

Drivers

- Different learning styles
- Different interests and habits
- Different students’ needs and interests
- Strong need of customised interface
- Popularity of e-portfolio
- Need to have control over one’s life and education

Advantages

- Helping students to take control over their educational process
- Greater effectiveness of learning – students learn what they are interested in and what enables them to explore the subject in greater depth
- Joy of learning

Challenges

- Difficulty meeting every student’s needs
- Lack of teacher’s control over student
- Difficulty assessing progress
- Abandoning of the standard syllabus by the student

Examples

- OLE project (Responsive Open Learning Environments) European and Chinese project examining the phenomenon of Personal Learning Environment. Identifying PLE tools and example uses:
<http://www.role-project.eu/>
- Plex
http://en.wikipedia.org/wiki/Plex_%28software%29
- Symbaloo EDU
<http://edu.symbaloo.com/home/>
- Evernote
<https://evernote.com>
- iGoogle
<http://www.igoogleportal.com>

Related Trends



Personalisation in Education



Individual Learning Style



Student-Centred Learning



Mobile Learning



Open Source Learning



Social Media Learning



Lifelong Learning



I. Modern education is personal

ANALYTICS AND BIG DATA

ANALYTICS AND BIG DATA

› Numbers that change education ‹

Related Terms

Intelligent learning system, data science, personalised learning, engagement metrics, learning analytics, concept level proficiency data, data processing applications, descriptive statistics, inductive statistics, prediction modelling, behaviour detection, user behaviour monitoring

A personalised learning environment requires the possibility to access content in an adequate form, in an appropriate dose and at a specific time. The concept of Analytics and Big Data is associated with collecting a large amount of data from users, its analysis, processing and visualisation, which is extremely difficult on the one hand, but provides valuable information on the other. Analytics and Big Data are applied in many areas of life, in the private sector, e.g. by supermarket chains that analyse the habits and behaviour of their customers. Data analysis is particularly important in research studies, including medical research. The analysis of a large amount of information coming from numerous measuring instruments or medical data on multiple patients provides the opportunity to confirm research findings or study the factors that contribute to the development of a disease and facilitates diagnosis. The development of data processing technology enables us to analyse in more and more detail the progress children make at school and explore the information focusing on creating better and more efficient educational content. Thanks to the automatic analysis of answers given in tests by hundreds or even thousands of students, we can identify the sentences whose content structure is incorrect, and create high-quality materials. If the majority of students give a wrong answer to a given question, it's probable that the question is misleading.

Big Data and automatic observation provide a chance to improve the working conditions of teachers as well as make full-on personalisation a reality. The analysis of data on many students and on each student individually makes it possible to select appropriate materials for the intellectual and emotional needs of a given student. The information also enables the teachers to support students in the process of discovering how to learn faster and more efficiently. It reduces the time and costs. At no point

in human history was there such a great amount of data and so many possibilities to make use of it. It is quite plausible that it will change the character of education for the better.

Drivers

- Development of technology of collecting, processing and analysing large amounts of data that may be employed in education
- Transferring educational materials to the Internet and to mobile devices
- Easy access to data and analytical tools which are becoming more and more efficient

Advantages

- Improved results and saved time
- Access to content adjusted to the needs of a specific student
- Elimination of educational content that has been structured in a wrong way
- Possibility to collect data on the entire population, not only individuals

Challenges

- Collecting data is not a value in itself. The key is to interpret it and introduce changes based on such interpretation
- Effective analytics should take into consideration the coincidence ratio
- Misgivings about harmful invigilation
- Risk of becoming blinded by the numbers and charts

Examples

- Data science and analytics community
<http://www.sigkdd.org>
- IBM Analytics solution for education
<http://www.ibm.com/analytics/in/en/solutions/industry/education.html>
- UNESCO Institute for Information Technologies in Education. Learning Analytics
<http://www.iite.unesco.org/pics/publications/en/files/3214711.pdf>

 *Related Trends*



Personalisation in Education



Adaptive Learning



Personal Learning Environment



Mobile Learning



I. Modern education is personal

ADAPTIVE LEARNING

ADAPTIVE LEARNING

› Tailor-made path according to your individuality ‹

Related Terms

Learning based on adaptive techniques, computer-based education, intelligent learning system, personalised learning, learning modality, adaptability, individual learning paths, adaptive hypermedia, intelligent tutoring systems, computer-based pedagogical agents, big data, engagement metrics, learning analytics, concept level proficiency data

Users of Google services receive profiled search results and product advertisements. A similar tendency is now appearing in education. The basic idea behind adaptive learning is that a computer can improve the outcome of a student's learning process, providing a system or set of tools to adjust the learning methods to the recipient. Thanks to a platform that gathers data on a user's behaviour and efficiency, it is possible to profile a student's performance and recommend further tasks, which in turn can be profiled and referred to further recommended activity.

Thus, the educational content becomes dynamic and truly interactive and the student becomes a means of their own individualised educational process. Computer software gathers enormous amounts of data, monitoring the user's activity and learning to adapt to the needs of a particular user. The data regarding the user is generated during a student's interaction with the system and with traditional materials (textbooks) as well as with unconventional resources (games, social network), plus during their contacts with teachers and peers. The system not only knows about the user's skills and abilities at a particular moment, but also is able to specify what actions and in what form and order should be taken to increase the user's chances of succeeding.

Every day, the system gathers detailed data about the user during online classes, e.g. their results, speed, accuracy of performance, delays. Students learn at their own pace while the program adapts continuously, posing challenges and encouraging them to learn in an optimal way. Furthermore, the behaviour of an individual user is compared against the data collected from hundreds and even thousands of other users. Thanks to this the adaptive learning platform not only creates the current image of a student along with diagnostic information, but also can anticipate problems and suggest remedies at an early stage. This eliminates the necessity of students taking tests after every lesson, chapter, semester or year of learning, tests that only detect deficiencies without providing answers on how to get rid of those deficiencies. In adaptive learning, information about specific

deficiencies and suggestions of corrections are presented to students and teachers on the spot, during the lesson, which enables immediate reaction. The application of adaptive techniques in learning also allows the teacher to save time spent on reaching all students with knowledge, which means more time for genuine interaction with them, and for supporting their involvement.

Drivers

- Catering for the needs of diverse students
- Mixed ability classes
- Problems with the acquisition of new material
- Low educational outcomes

Advantages

- Accurate content design enables the system to assess the student's ability and assign tasks within their capability
- Helps the teacher to identify the natural talents and skills of the students
- Students may absorb educational content via different, personalised educational paths
- Helps to enhance the skills of weaker students as well as develop and reinforce the natural talents of more gifted ones
- Makes it possible for the teacher to monitor each student's progress, often in real time

- Educational methods based on adaptive techniques produce impressive results in the individualised teaching of mathematics

Challenges

- Difficulty teaching facts or providing information that is subject to interpretation
- Computers will never be able to replace a teacher
- Adaptive techniques are less appropriate in certain fields of education, such as philosophy
- They are not a miracle cure to problems in education, and the application of this technology can both improve and worsen the performance of students
- Very expensive cost of developing content in multiple versions
- Difficulty providing the user with the information that they are ready for at a particular moment
- Changes in the material may pose a certain problem in the application of the adaptive method each time the user

moves on the educational path

Examples

- ALEKS Corporation – company offering automatic system of diagnosing deficiencies in knowledge and materials to cope with them <http://www.aleks.com/>
- Carnegie Learning – publisher offering, along with traditional textbooks, adaptive programs for mathematics learning (Cognitive Tutor) for secondary school students <https://www.carnegielearning.com/>
- CogBooks Ltd – company offering corporate trainings based on adaptive platforms <http://www.cogbooks.com/>
- eSpindle Learning (learnthat.org) – non-profit organisation, creating and delivering software for learning vocabulary and spelling rules using adaptive techniques
- Knewton – company offering solution for adaptive learning, cooperating with many publishers and educational content providers <http://www.knewton.com/>
- McGraw-Hill Education – company offering educational content, educational software and educational services, using adaptive techniques in its products for college students (LearnSmart) and high school students (Power of U) <http://www.mheducation.com/>
- Pearson – educational publisher offering among its products a program utilising adaptive techniques (Success Maker)

designed for reading and mathematics learning for primary school and high school students <https://www.pearson.com/>

- Sherston Software – British retailer of educational programs offering PlanetSherston – learning platform utilising adaptive techniques <http://shop.sherston.com/>
- Grockit – online game for multiple players offering test preparation. Learning takes place through interactive game with other players, learning for the same test <https://grockit.com/>

Related Trends



Personalisation in Education



Analytics and Big Data



Student-Centred Learning



Competence-Centred Learning



Relevance-Oriented Learning



Semantic Web



I. Modern education is personal

MOBILE LEARNING

MOBILE LEARNING

› Learning anytime, anywhere ‹

Related Terms

Mobile devices, anytime, anywhere, learning-on-the-go, ubiquitous learning, handheld learning, m-learning, m-learners, informal learning

Personalisation in education means access to content whenever we need it. What's more, it assumes to provide a student with tailored materials using tools most appropriate for them. Thanks to technology, these guidelines may be accomplished with the help of mobile devices.

For some people, mobile education is a way of acquiring knowledge via applications designed for mobile devices, such as tablets or smartphones. For others, it's an opportunity to use mobile devices for educational purposes. The number of educational materials dedicated to mobile devices is growing rapidly. We can find textbooks, applications for foreign language learning, and educational games and programs on the market. Websites are increasingly viewed on mobile devices and need to be designed accordingly. Mobile devices are getting cheaper, leading to users, which in turn, create the need for mobile-friendly materials. The teachers' attitude towards the presence of mobile devices at schools is also evolving. Several years ago, using mobile phones at schools was strictly forbidden, whereas now a growing number of schools want to provide their students with tablets for educational purposes, and are reviewing their policies on the use of mobile devices.

Mobile education is also associated with cloud computing. Location of data in the cloud means that all information is kept on multiple servers, as opposed to an online location where the data is stored on one server. For the end user, the main benefit is having access to their data via several devices (e.g. computer, tablet, smartphone) – always in the most recent version, regardless of the device.

Drivers

- Need for access to knowledge at any time and place
- Need for student-centred education
- Need for self-paced learning
- Students want to decide on the range and subject matter of the material
- Growing popularity and accessibility of mobile devices
- Outdoor education
- Instant access to education

Advantages

- Easy access to knowledge through mobile devices
- Possibility of self-paced learning
- Easy communication between teacher and student as well as among students
- Personalisation of learning
- Access to knowledge for students with special needs and conditioning
- Possibility of active participation in educational events e.g. conferences, speeches, webinars, etc. in real time, without leaving home (saving time and money)
- More prestige for schools that use tablets, building their image as a modern institution

Challenges

- Students' attention may easily be distracted from educational purposes
- Mobile device, as any other electronic appliance, may break down
- Because of fast technological advancement, it is necessary to update/upgrade the devices, which may be costly

Examples

- Applications for mobile devices by Young Digital Planet
- Vast choice of other educational applications available in App Store, Google Play and Windows Marketplace
- Solutions for creating interactive textbooks: Digital Books Solution, iBook
- Worldwide use of digital devices during classes at schools
- Teacher applications for use in the classroom: Groovy Grader – application for quick calculation of students' test results; iLeap Pick a student (helps to ask individual students questions and thus activates the students from one or more classes)
- Teacher's Assistant Pro – electronic register for mobile devices, enables the teacher to instantly update student-related data if they have a mobile device with online access at hand

- Wordpress iPhone app – for teachers who write a class or school blog
- BookLeveler – helps to establish the level of difficulty of text in a book by means of the ISBN code, helps to adjust the content of a particular book to the syllabus

Related Trends



Personalisation in Education



Individual Learning Style



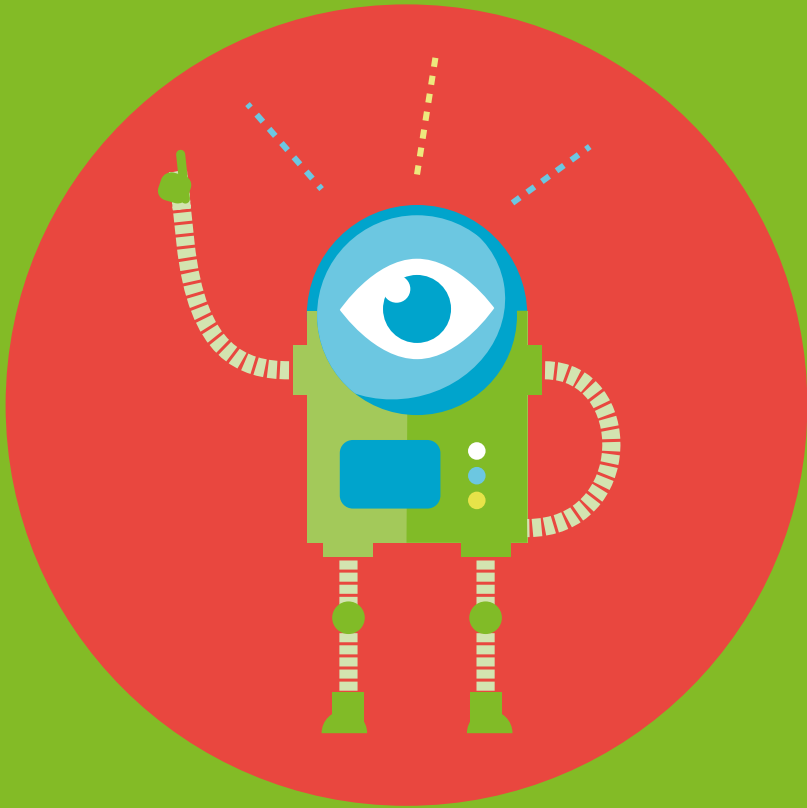
Informal Learning



Outdoor Education



Snack Learning



I. Modern education is personal

VIRTUAL TUTOR

VIRTUAL TUTOR

> Top-flight tutor to help you personalise yourself <

Related Terms

Virtual assistant, e-learning assistant, virtual teaching assistant, one-on-one interfaces, distance education, many-to-one tutoring, video learning, online training

Personalisation in education assumes that students develop their own educational path, independently manage themselves and also decide on how and what they want to learn. This forces a departure from the traditionally perceived role of the teacher. A child who follows their own path needs above all support to achieve self-awareness and help to develop skills for effective learning. The tutor's help is required to accomplish this task, by showing students tools, drawing their attention to the learning process, encouraging them to analyse and draw conclusions. The tutor is always there whenever the child needs them. Modern technology assists students regardless of time and place in the form of a virtual tutor.

The virtual educational assistant is becoming more and more popular throughout the world as an adjunct to or part of online learning. Students from distant parts of the globe can attend classes taught by renowned teachers without leaving their hometowns and even enrol in courses organised by prestigious universities such as Harvard or Oxford. Advanced systems help to trace progress and personalise education, making it more reliable. The fast growth in the number of users of the Khan Academy and Coursera.org has proven that there is an extraordinary demand for these types of services.

When parents come to realise what true personalisation in teaching is, they will at all costs seek to find the best teacher for their children. They will learn that without such a person there is no chance of development worthy of the best opportunities. So the future of the idea of a virtual mentor seems bright. In the near future, we will not be limited to the closest environment to find the appropriate person. The ideal tutor will be able to live on the other side of the world and only connect with us whenever there's a need. It's possible that their role will be much more prestigious than that of teachers today and their salaries will correspond to those of coaches of top-class managers.

Drivers

- Growing popularity of personalised teaching
- No time for individual attention paid to students in the classroom
- Change in the role of teachers in education
- Globalisation and the ease of becoming a trainer

Advantages

- Lower staff and infrastructure costs
- Equal educational opportunities for children living further from urban areas
- Easier access to high-quality educational services
- Personalisation of education
- Education anytime and anywhere
- Easier access to native speakers of English or other target foreign languages
- More precise tracking of progress in learning

Challenges

- Low completion rate for most online courses
- Virtual teachers may replace people altogether
- Lack of communication and social skills
- Dependence on technology
- Unreliable interface

Examples

- Technology Tidbits: Thoughts of a Cyber Hero blog
<http://cyber-kap.blogspot.com/2011/09/top-10-sites-for-online-tutoring-and.html>
- Mashable news website
<http://mashable.com/2012/08/28/homework-tutor-instaedu/>
- ALEKS corporation
<http://www.aleks.com/>
- Carnegie Learning publisher
<http://online.carnegielearning.com/>
- Cognii assessment technology developer
<http://cognii.com/>
- Coursera education platform with free online courses
<https://www.coursera.org/>
- Khan Academy non-profit organisation offering free educational material
<https://www.khanacademy.org/>

 *Related Trends*



Personalisation in Education



Learning to Learn



Process-Oriented Learning



Student-Centred Learning



Mobile Learning



Edutainer



Alina Guzik

TIPS & TRICKS

TIPS & TRICKS

- Encourage your students to employ self-observation. Suggest making collages that will illustrate “My perfect learning environment”. On the reverse, the students should present the things that disturb their learning process and the things that they avoid when studying. Reward your students for self-observation of their own learning process
- Create a profile of each student and note their positive characteristics and talents
- Encourage students to take different roles when working in teams. Ask about the roles they feel comfortable with and the roles they don't like and why. Encourage students to develop their talents and motivate them to perform tasks that require effort and breaking through their own barriers
- Before you evaluate students, let them give themselves scores and explain the reasons
- Before you introduce a new topic, let the students find some information on their own. Gather all the resources found and classify them according to their form. Let your students pick materials they like most. Pass on the resources to other classes
- Every month, dedicate one of your lessons to exploration and presentation of new learning techniques
- Share your knowledge on the ways and times it is easiest for the brain to learn
- Encourage your students to try to find a personal context for the new content. Ask the students what they feel about the new content
- Allow your students to decide what they will learn on their own to the extent possible. Every month, dedicate one of your lessons to allow your students to present a topic that is loosely related to the subject. Let them choose any form of presentation
- Motivate students to be the designers of their own educational path. Suggest that they should create their own map of objectives and visualise their development within a time span of a week, a year, two years or a few years. Encourage them to perform the task on a regular basis
- Use the project method. Let your students determine the final product of a project and choose the methods to be used on their own



I. Modern education is personal

CASE STUDY

Finding a way to incorporate the use of tablets during classes with elementary school third graders

Challenge:

In June 2013, we won Samsung Galaxy Tab 2 7.0 tablets for the realisation of Friends Fur-ever project under the eTwinning programme where we took first place. As Poland still lacks materials indicating the ways mobile devices could be incorporated into the education of younger children, working with tablets was quite a challenge for me. I was learning as the children were learning. I ran a blog and read all English articles on the subject, including other teachers' blogs.

Process:

We began working with tablets in October 2013. From the very beginning, we worked according to the BYOD model – a student has the tablet for his own use, takes care of the device and makes sure that it is always ready for use, installs and removes all apps and is able to use the device at home as well.

It was a very convenient solution as I was not the administrator of the devices and the students, by using the tablets in their free time, had a chance to get to know better the technical features of the equipment. I often relied on their knowledge in this respect. I always had two extension cords and a charger ready in the lab, which turned out to be very useful at the end of the school year when the batteries in the tablets became weaker. We laid down the rules of using the tablets in the classroom together. I wanted to make sure that they would not be treated like a toy and that they would not distract the students. The parents controlled the use of the tablets at home. At the beginning, the device was a source of enormous temptation and we were afraid that it would replace other activities in which children of such an age should engage. In this respect, we established cooperation and respected the arrangements of others. Consistency was crucial.

We used the tablets over three school days. On those days, we had a lot of classes and I did not have to worry about the fact that the students would not manage to complete assigned tasks. There is nothing more frustrating than a school bell that interrupts an exceptionally interesting lesson.

I tried to incorporate all types of activities into my classes and give the children the chance to draw, paint and write in a conventional way. My idea is that a tablet is one of the elements of equipment of a pencil box. If there is a need to use it, it should be used. But if it is not required, it should be lying next to a ruler or a rubber. I didn't give up the use of student books and notebooks but I limited the use of worksheets.

The apps which the students installed on their tablets were used during various classes: mathematics, Polish lessons, environmental education, music classes and English classes. Some apps were suggested by the students themselves and usually those were good suggestions. The children were also happy to use the tablets to read books.

Effects:

After nine months of working with third graders with the use of tablets, I can honestly say that my students learned how to work in teams more effectively and that their communication and critical thinking skills improved. They are creative in the use of the applications and they come up with new ways to use a given app. They are eager to perform the tasks which were their idea and share the results of their work. They document their actions with pictures and videos which I later receive by email. They understand what copyright is and they comply with the rules for online safety. If they find a new app, they can indicate its educational benefits. They know that a tablet is meant not only for entertainment purposes but also for education and communication for autistic people. The students did not replace paper books with e-books nor did they replace drawing with crayons with drawing on the screen of a tablet. They are responsible users of mobile devices and others can learn from their example.

Education of ill children as an illustration of trends associated with personalisation

Challenge:

I was faced with the challenge of working with a chronically ill child. Marysia, a girl in third grade who had gone through cancer, was to have an individual education plan and I was to teach her two hours of English every week. I also taught English in Marysia's class so I decided to engage her in our regular classes by means of high technology. Since during her stay in the hospital the girl became proficient in the use of a laptop and the Internet, I thought it was a perfect chance to make use of her skills.

Process:

I asked her if she would like to run a blog and in this way meet her classmates. At the time it was impossible to visit Marysia at home due to her susceptibility to infections. The girl was ecstatic at the suggestion and after I had talked to the girl's mother, presented her with the idea and the pros and cons, I helped Marysia to set up the blog. At the beginning, I helped her with the administration. Marysia quickly learned what blogging is about. She invited her classmates to join her virtual world and took care to make her entries interesting and correct in terms of spelling and style. Her classmates left her comments and sent their best wishes. I saw that it was important for her and gave her additional strength to go through the hardest stages of her illness.

We began to prepare exercises for her classmates together – educational games at zondle.com which served to help them memorise their English vocabulary. Marysia also prepared some exercises on her own. She prepared illustrations for the games and was really happy that her peers were willing to play the games. I suggested we should have a lesson via Skype. Once a week, I called Marysia during a lesson with her class. The girl answered questions I posed during classes, sang songs and recited rhymes along with everybody else and listened to the answers of the other children. She was really happy to see her classmates whom she missed very much. After some time, Marysia and I prepared

some parts of our lessons together and she could, for example, present riddles to the other children, listen to their answers and applaud them. She showed initiative. Studying was her therapy and a massive motivator to meet with her peers.

I accompanied the girl in this virtual world for the duration of the entire school year. I showed her new tools that helped her run the blog, learn and have fun.

 *Effects:*

Marysia is a very talented girl. She is very ambitious and demonstrates the desire to experience, explore and learn. English classes via Skype or Google Hangouts enabled her to keep in touch with her classmates and improve her skills. She felt needed and accepted and this is a very important element of the therapy of a chronically ill child.

<http://wdomku.jimdo.com/>

A tablet in the classroom – creating a mobile learning environment

Challenge:

The principal aim of the project was the creation of a mobile learning environment using free apps and tools. As tablets are getting more and more popular and the costs of Internet connection are decreasing, it seems that tablets are replacing (even portable) computers in everyday life. It means that we can use these devices to build a private learning environment that provides access to online educational content, editorial tools and teaching platforms. If your work is well-organised, you make contacts and teachers are provided with appropriate training, you will be able to create a mobile learning environment.

This kind of work environment enables you to realise various educational tasks and, in case of teachers, may go beyond didactics and provide support in realising their care- and management-related goals.

Process:

Having defined the principal tasks to be realised by means of a mobile device, you have to proceed to the selection of appropriate apps. Considering the editing capacity and display size of contemporary smartphones, as well as the users' knowledge of the possibilities they offer, they will serve not only as channels of information consumption, but also as tools for creating and modifying the content as well as sharing the effects of the work.

In September 2011, Feliks Szotdrski Middle School in Nowy Tomyśl became the first public school in Poland to implement tablets in school education.

The implementation of Apple iPads at the school in Nowy Tomyśl involved:

- Establishing cooperation with the partners – Apple Poland – material support; Cortland – technical support; Łódzkie Centrum Doskonalenia Nauczycieli i Kształcenia Praktycznego (Teacher Training and Practical Education Centre in Łódź) – methodological support
- The purchase of 47 iPads for students and teachers
- Delivering the tablets to school
- Providing the teachers with tablets
- Providing the students with tablets

Effects:

The project of tablet implementation at the school in Nowy Tomyśl has been extensively covered by trade press. As the authors say: “The most significant effects are: easier and more convenient work both for students and teachers, the possibility to use the tablets for the purposes of extra-didactic work by the teachers, and finally the most important element: the use of the tablets to create and consume knowledge by the students”.

For the purposes of constructing a simple mobile learning environment, I recommend 10 mobile apps. They can be classified into the following groups:

- Access to educational resources: TED, Khan Academy, Kindle Mobile Reader, Coursera, Feedly
- Document editing and sharing files: Google Drive, Dropbox
- Taking and editing notes: Evernote, Skitch
- LMS access: Moodle Mobile



Piotr Milewski

MODERN EDUCATION IS FUN

MODERN EDUCATION IS FUN

Anyone who has had a chance to observe a little child at least once will know what a joy it is for such a child to take on a challenge. First steps. Climbing an armchair. Tying shoelaces for the first time. Riding a bike.

We love to overcome obstacles, reach higher, score, explore the world and push our boundaries. We ignore the word “impossible”, constantly try, test, examine and look for new solutions to go even further.

What is it about schools that turns off our natural and innate curiosity of the world and wipes away the joy that comes from learning new things?

Education specialists need to find the answer to this question as soon as possible. Unfortunately, schools can do without it. After all, lessons may be boring or uninteresting. Teachers may discourage instead of encourage and turn the true spirit of competition into a rat race or logical thinking into thoughtless cramming. Children have to go to school no matter what it offers them.

The game industry does not have the luxury to disregard this need for a change. Children and teenagers are its most important recipients: they have to be taken care of in the best way possible; they have to be provided with a high-quality product. Engaging. Addictive. A product which brings joy and gives a sense of achievement and satisfaction. A product which positively stimulates by providing immediate feedback when proceeding to the following rungs of a precisely structured ladder of challenges and tasks. If the product is bad, a child will simply not buy it.

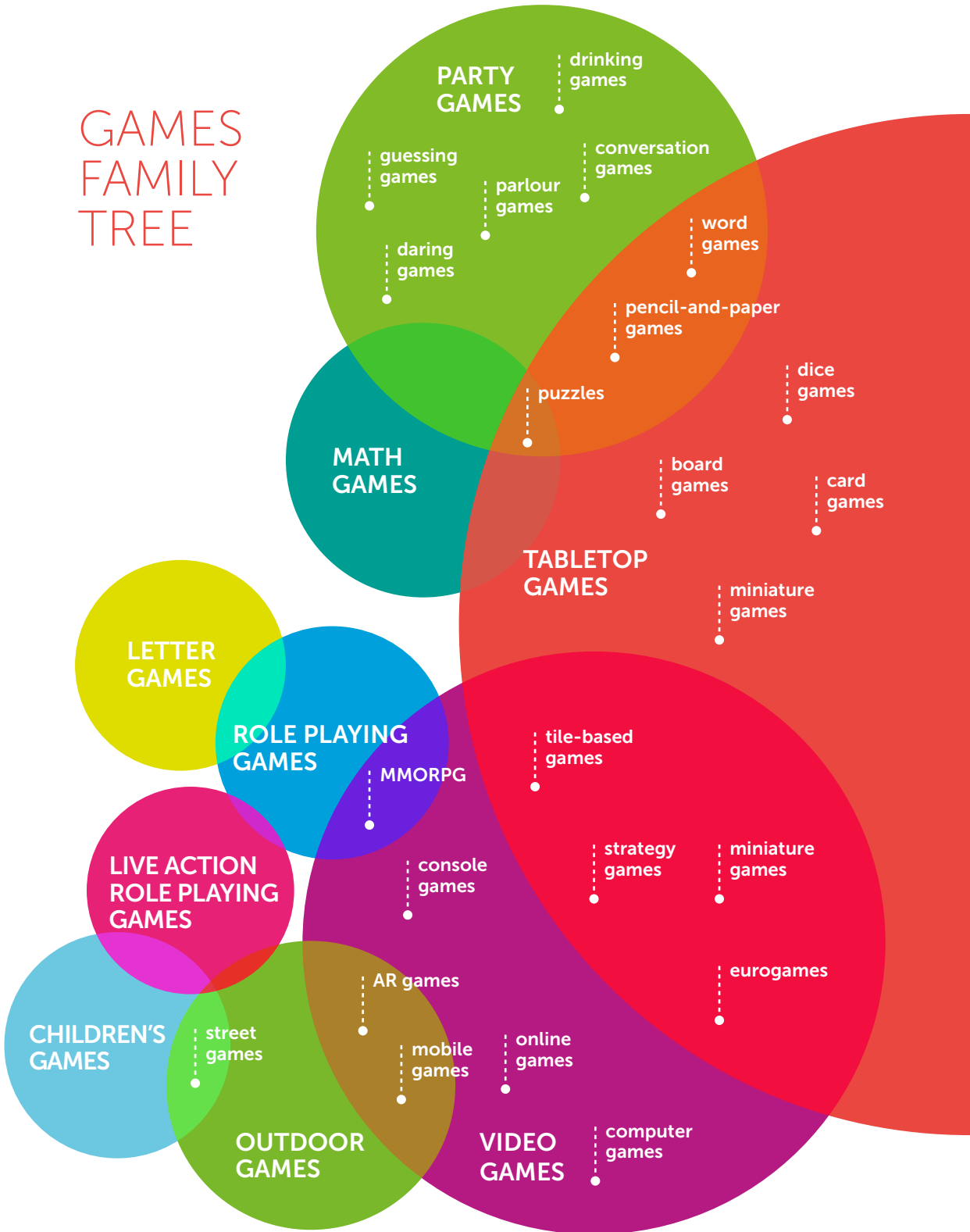
It's surprising how scarce are the people who actually think about the intellectual effort needed to learn how to win a game. And how this effort is perceived only as enjoyment.

Now here is a question. Can learning be as much fun as playing?

And the answer is: of course it can.

We just have to realise that the distance between one and the other is not as long as we think.

GAMES FAMILY TREE



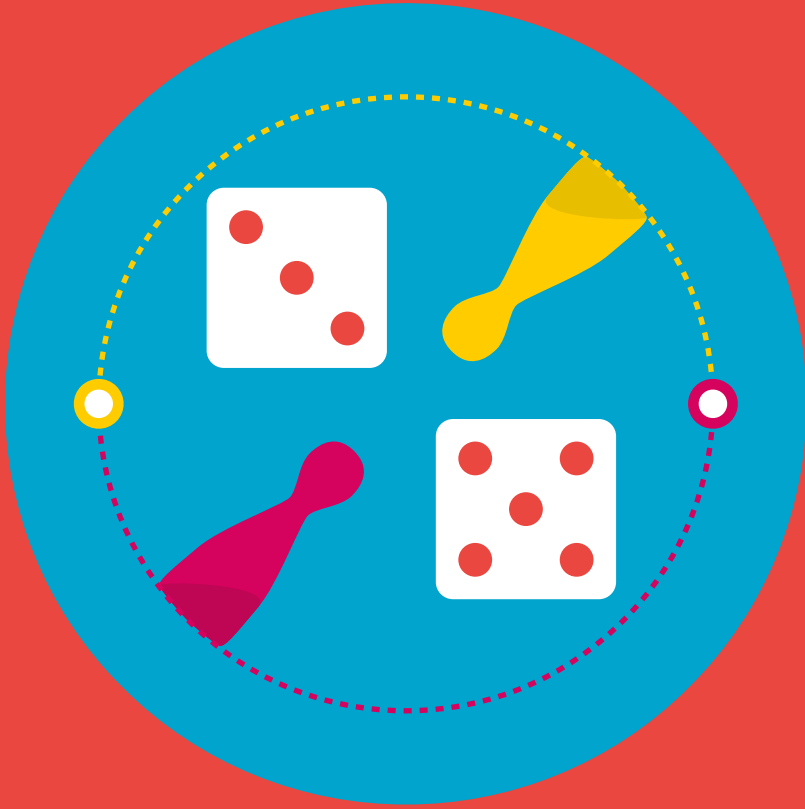
II

Modern education is fun

1. Game-Based Learning
2. Gamification
3. Edutainment
4. Storytelling with Technology
5. Serious Games
6. Edu-LARP and Drama
7. Outdoor Education

Tips & tricks to make teaching & learning fun

1. Case Study: Location-based games with the application of QR codes
2. Case study: Creating digital stories
3. Case Study: Finding a way to influence student behaviour



II. Modern education is fun

GAME-BASED LEARNING

GAME-BASED LEARNING

› Learning through play ‹

Related Terms

Board games, card games, video games, storytelling games, MMOLG games, MMO games, ILE platforms, educational games, eduGames, serious games, massively multi-player online learning games, immersive learning environments, state of flow

Merely a few years ago, games were considered to be something anti-educational. Parents thought that the time their children spent playing games was wasted from an educational point of view. As time went by and games were subject to a more careful observation, it turned out that, contrary to what might seem, while playing the players constantly learn: how to play, what strategy to adopt, and finally – what they should do to win. It turned out that games form a type of entertainment that cannot be experienced passively. To be able to find pleasure in playing, you have to acquire a lot of knowledge and master certain skills.

The appeal of games aroused interest among researchers who noticed a certain difference between the players' approach towards games and the students' approach towards learning. As opposed to the latter one, games engage players and teach them how to solve problems. It happens mainly thanks to the immediate feedback given to the players and the fact that they experience the so-called flow (according to a theory developed by Mihály Csíkszentmihályi) where the challenges correspond closely with the players' skills. Education specialists are trying to introduce this motivating potential of games at schools. Games embody many important aspects of learning, such as: interaction, risk-taking, adjustment, challenges and consolidation, providing required information "on time" and "on demand" and putting it in an appropriate context and situation (James Paul Gee Divers).

Game-based education involves the incorporation of games into lessons. Considering the educational aspect, there are two types of games. There are games that are strictly entertaining and those designed with the educational aspect in mind whose aim is to entertain and teach at the same time. And it's not only the latter group that can be used to teach. The application of all games is wider than some may think.

You can use ready-made social and computer games, which requires an analysis of their content on your part. You have to understand the mechanisms and verify the values the game presents. You may discover that well-known card games will be helpful in teaching mathematics (e.g. a poker game when explaining the probability theory) and many commercial computer games may be found useful in teaching geography, history, astronomy or physics.

It's a lot easier to use educational games where the educational content has already been incorporated at the design stage. They have an advantage over traditional games because their educational value is significantly higher. But the vast majority of them fall behind when it comes to gamability and appeal.

The principal aim of applying games in education is to increase students' engagement and motivation, but games will not solve all the problems that teachers and students encounter. They constitute only one of the elements and should be integrated with other methods. Although, considering the specific character of the games, their significance in education will surely grow.

Drivers

- Games market evolution
- Revival of interest in traditional social games
- Technology and social media development
- Introduction of ludology (game studies) as a separate discipline

Advantages

- Information provided in an appealing way
- Knowledge is acquired in one's free time and the process is not associated with duty
- Education and entertainment cease to be perceived as opposites

Challenges

- Lack of possibility to verify the facts, data and information presented by games
- Difficulty finding games which correspond to a given subject

Examples

- Fun games for learning math
<http://www.mathblaster.com/>
- Probability and poker
<http://www.intmath.com/counting-probability/poker.php>
- Mainstream game about the rise and fall of civilizations
<http://www.civilization5.com/>
- Mainstream games about the art of war
<http://www.totalwar.com/>
- Mainstream games about building America
<http://www.oregontrail.com/hmh/site/oregontrail>
- A set of games that can be used in education
<http://www.eduplace.com/edugames.html>

Related Trends



Mobile Learning



Social Media Learning



Problem-Based Learning



Snack Learning



II. Modern education is fun

GAMIFICATION

GAMIFICATION

> Grafting commitment <

Related Terms

Game-based learning, ludology, pervasive games

Over the last decades, there has been a boom in the games industry. People all over the world play a lot. With the arrival of smartphones, tablets and social media, electronic games gained a completely new platform and drew millions of users. On the other hand, there has been a revival of interest in traditional social games; bored and overwhelmed by the virtual world we look for a pretext for meeting up with other people and having fun without the electronics. These phenomena were observed not only by researchers, but also by marketing and education specialists. Games engage, absorb and make you perform abstract and absolutely useless activities with enormous passion for many hours and for a solid sum of money. Like ancient alchemists, specialists decided to extract the magical ingredients of games that are responsible for the above effects and use them for other purposes: increasing sales volume or aiding the process of learning. This is how gamification was born. In general, gamification refers to the use of techniques, their dynamics, construction and mechanisms, known from games in order to promote a given type of behaviour. It means that such thinking patterns are used in situations unrelated to the gaming environment. Education is an area where these patterns may be applied and may serve as a cure for lack of engagement and interest or boredom.

Gamification should be treated like a tool; very efficient and precise, but, above all, comprehensive. Simply changing an attendance list with the names to a list with personalised avatars or changing the traditional marks to points and progress bars will not make a lot of difference. If anyone wants to introduce gamification, the selection of its components will not suffice. Only the development of a coherent system will enable you to reach the desired goals.

Just as a good game, such a system must feature elements that will work in three spheres. The first one is dynamics, i.e. the perception and experience of the game, it includes elements such as a plot, narrative style, range, target and goals. The second sphere is mechanics, i.e. a set of rules, the engine of the entire system which pushes the game's action forward. The last sphere includes elements intended for rewarding the players, i.e. well-known rankings, points, levels, medals, avatars and virtual goods.

To make sure that gamification is efficient, you have to combine the tools from each of the three groups. But before that happens, you have to answer the fundamental question: what is my goal? What are the emotions I want to provoke? What are the recipients supposed to experience and why? A well-designed system will enable you to guide the user along a planned route to a predetermined destination and to make the journey absorbing and satisfactory. Gamification of the education process is definitely worth a try. To be successful, you have to use it skilfully and remember that it is a complicated tool that is intended for accomplishing a specific goal and producing specific results.

Drivers

- Research in games and making game mechanisms more popular in business
- Rapid development of the games market

Advantages

- Boosting the participants' engagement
- Making the subjects of gamification more appealing
- Accomplishing the desired goals and effects within a shorter period of time
- Providing the opportunity to design, monitor and influence the participants' behaviour

Challenges

- Lack of precise goals may make the efficiency level lower than in the case of traditional methods
- It is difficult to strike a balance between educational components and components of the game

Examples

- A blog about gamifying a learning course <http://gamingtheclassroom.wordpress.com/>
- Playing out the real world problems <http://www.instituteofplay.org/>
- PlayMaker school <http://www.playmaker.org/>
- Gamification Research Network <http://gamification-research.org/>
- Gamification Co – news and materials on gamification <http://www.gamification.co/>

Related Trends



Adaptive Learning

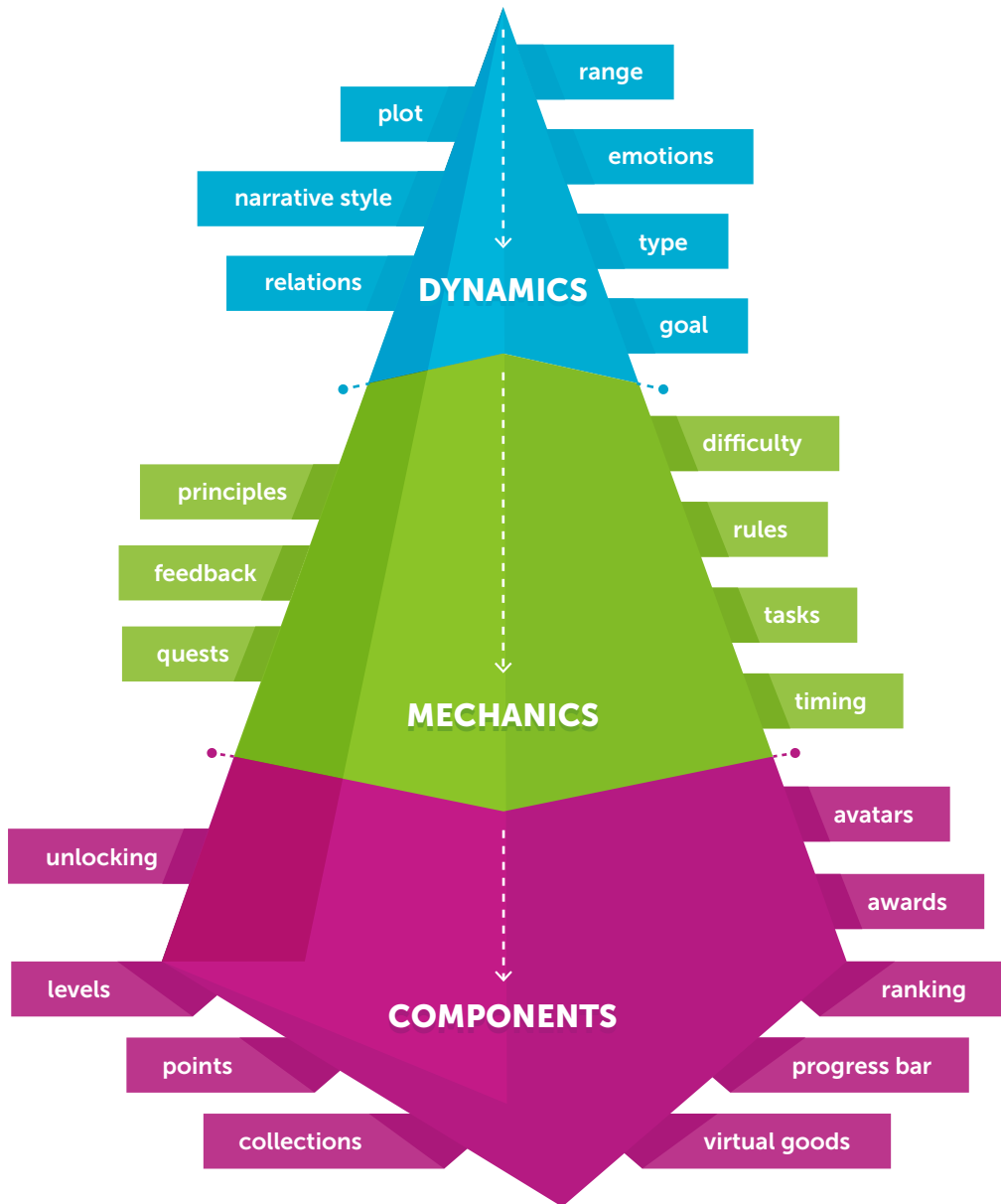


Informal Learning



Scenario-Based Learning

GAMIFICATION ELEMENTS





II. Modern education is fun

EDUTAINMENT

EDUTAINMENT

› Educate by entertaining and entertain by educating ‹

Related Terms

Educational entertainment, educational television, learning by doing, empirical education, enter-educate, pro-social entertainment, pro-development entertainment, info-tainment, cloaked learning, covert learning, stealth learning, learning by playing, experiential learning, serious play

Edutainment is a neologism that combines two words: education and entertainment. It refers to the use of entertainment in teaching and to all types of activities whose priority is to educate and entertain at the same time. The fun factor is a way to make the knowledge transfer more attractive, reach the recipient more easily or even hide the educational content.

The idea to combine the knowledge transfer and shaping social attitudes with an attractive and entertaining formula is not new. The beginnings of edutainment go back to the 1950s when the British BBC Radio broadcast the first episode of the audio play "The Archers". Until 1972 the programme had an educational character. The saga about the residents of a small English village featured elements of knowledge about economy, ecology and agriculture. Although the programme lost its educational character after 1972, it is still aired. Since 1969 Sesame Street has remained the greatest edutainment project. The show takes the audience all over the world by storm; children, parents and grandparents in 120 countries know it very well.

The application of edutainment is very wide. It's useful in spreading any kind of knowledge – from the traditional information concerning a school subject to important social matters and skills useful in everyday life. Education understood in such a way can be incorporated into any type of entertainment: a song, a soap opera, a revue, a game show, TV series and other popular entertainment formats (e.g. films, radio, toys, museums).

Learning by playing is particularly significant when new generations of digital natives appear. They seem to have been born with a smartphone in hand. The way that they perceive the world and learning requires the application of new didactic methods and means. You have to master their language by using the tools that they use every day in order to be able to reach them. This means you need to resort to films, cartoons and TV series which are perceived by children and teenagers as fundamental elements of culture.

Second come entertainment shows and popular science programmes (mainly those created by independent authors, freelancers on youtube), social media, blogs and comic books.

Regardless of the media used, there is one aim – to create an unforgettable experience: entertain and educate at the same time. Edutainment gives you a unique chance to reach contemporary students and there is no way you can teach if you cannot reach.

Drivers

- Social changes caused by the technology development
- Moving from passive to active culture consumption

Advantages

- Creating positive associations with education, consequently, changes the students' attitude towards learning and knowledge which will improve students' results at school
- Making students more motivated by making them more engaged

Challenges

- Striking a balance between education and entertainment might be difficult – if there are too many educational elements, the product will become boring and if it is too entertaining, it will overshadow the educational value of the project

Examples

- BBC Schools <http://www.bbc.co.uk/schools>
- Learning English with BBC <http://www.bbc.co.uk/worldservice/learningenglish/flatmates>
- Sesame street <http://www.sesamestreet.org>
- Educational children's books <http://www.reader-rabbit.com>
- Using the internet – games about the safety rules <http://mac.gov.pl/aktualnosci/dzieciaka-i-loco-przygody-w-sieci-czyli-jak-bezpiecznie-korzystac-z-internetu>

 *Related Trends*



Social Media Learning



Lifelong Learning



Informal Learning



Snack Learning



II. Modern education is fun

STORYTELLING WITH TECHNOLOGY

STORYTELLING WITH TECHNOLOGY

> Information in context <

Related Terms

Narrative, digital storytelling, gamebook, case-based instruction, narrative-based instruction, scenario-based instruction, problem-based instruction

Instruction based on storytelling is one of the oldest educational methods known by humanity. Skilfully told stories constitute a collection of well-organised and concrete information that gives meaning to our life and environment. A story usually conveys a deeper meaning than a simple example. Storytelling is an antidote to learning by heart and mechanical memorisation of definitions without an attempt to understand the context. Thanks to the use of fictional elements, it combines all components into a whole, which makes the story attractive and original. It forces you to think and use both the left and the right hemisphere equally. This is one of the most powerful communication forms which has a huge potential as an educational tool.

Storytelling is creative and interactive. It makes it easier to store information in the long-term memory. It helps students understand, remember and retrieve. After all, every story presents a sequence of information ordered in time. Thanks to the universal mechanisms such as a plot, action, motive or an archetype, it focuses attention by placing data in a context based on real experience. It also absorbs and arouses emotions which are easily stored in our memory.

By presenting information in such a way, you enable the recipients to be something more than passive listeners and observers – you enable them to control the final result. The learners can actively narrate the story, which makes the process itself similar to playing a narrative role-playing game. High technology makes it easier and the rapid development of storytelling for entertainment restores storytelling to its rightful place in education.

Drivers

- Innate passion for stories and storytelling; children of all origins receive the first information and are taught values via stories and tales embedded in their culture
- Brain's natural ability to recognise and seek schemas
- Technology development facilitates the construction of a narrative

Advantages

- Stories provide context and often present real problems. They engage the listeners and make them use a larger amount of resources. They evoke emotions which make learning more effective

Stories:

- arouse curiosity and interest capturing students' attention and engaging them in the education process
- help to create mental images which stimulate imagination and shape the brain development
- increase concentration and improve reading, verbal and listening skills
- improve the understanding of the cause and effect and the relationship between them, which facilitates the understanding of the plot and enhances the ability

to predict the following events. It boosts the critical thinking and listening comprehension skills

- form a structure and create a flow of information building relations between events and increasing their significance, which makes the material easier to remember and recall
- make learning easier and more relaxing by presenting the information in a safe context and in a well-known form
- improve the relationship between a student and a teacher making it more personal
- create magic and make listeners admire the beauty of the world
- develop understanding and respect for other cultures; promote the acceptance and tolerance of cultural, religious and political differences

... thanks to technology, they enable the students to be more creative storytellers by allowing them to:

- have a dynamic and attractive approach to learning
- create a video, comic book or an animated story within a short period of time
- combine writing a story, illustrating and collecting images, recording and selecting the music

Challenges

- It is easy to confuse the motifs if you make an extensive use of the narrative
- If the stories are not told in the right way, the students may associate the problem with a wrong solution
- It is not always possible to tell a convincing and snappy story about each topic
- The stories have to be short, concrete and linked to each other. If there are too many elements, the students may get caught up with details instead of focusing on the main message

Examples

- National Storytelling Network
<http://www.storynet.org>
- Tellabration – a worldwide night of storytelling
<http://www.tellabration.org>
- Medea Awards – Quand la colère fait tomber les masques, And the Oscar goes to...
http://www.medea-awards.com/files/publications/MEDEA-Awards-2012_press-release_20121115_EN.pdf
- Online storytelling course
<https://iversity.org/en/courses/the-future-of-storytelling>
- Digital storytelling course
<https://www.coursera.org/course/digitalstorytelling>

- Center for Digital Storytelling
<http://storycenter.org/>
- Storytelling in the classroom with ready-made lesson plans
<http://www.storyarts.org/classroom/>
- Building a story with the use of various media
<http://www.tstoryteller.com/transmedia-storytelling>
- A story building tool
<http://designthroughstorytelling.net/periodic/>
- Society for storytelling
<http://www.sfs.org.uk/>
- Stanford storytelling project
<http://web.stanford.edu/group/storytelling/cgi-bin/joomla/>

Related Trends



Peer Learning



Informal Learning



Scenario-Based Learning



II. Modern education is fun

SERIOUS GAMES

SERIOUS GAMES

Playing seriously

Related Terms

War games, kriegsspiele, games for change, games for health, engaged gaming, corporate games, business games, simulations, organisational-dynamic game, art games, Nordic-style games

The term “serious games” was first used in the 1970s. However, despite the fact that some “serious games” have been known since the 19th century, their career took off only in recent years. Their first well-documented progenitor was the German Kriegspiel, i.e. war games, which were widely used in training future officers of the Prussian army.

Today, the creators of serious games are interested in other areas, although war games are still used in the military as an educational tool. Today, such games deal mainly with social problems like: environmental protection and ecology, inequality and social exclusion, health care, economy, industrialisation, planning and management.

What is the difference, apart from the subject area, between serious games and educational games? First and foremost, the subject area prevails over the entertainment factor. A model, well-organised educational game is equally effective in transferring knowledge and in entertaining – it absorbs and shows the implemented educational content in a pleasant way. Serious games are not always pleasant. They might be difficult, cause discomfort, challenge the players’ beliefs and pose difficult and awkward questions. This is their purpose and value. This is why they are full of contrasts: on one hand they attract players thanks to their strictly gaming features, on the other hand they repulse by throwing the recipients outside their comfort zone.

It is natural to ask about the purpose of games whose sole name sounds like an oxymoron. One of the most serious accusations aimed at the contemporary education is its poor use in the real world. In other words, it gets more and more difficult to interpret knowledge in the world surrounding us. There are two currents of education in a young person’s life: school education and life education. The first one is often perceived as art for art’s sake – students don’t understand how they could put their knowledge to practical use. As they grow up, they gain experience parallel to learning at school. Experience that will enable them to function well in society.

And here is room for serious games and serious subjects usually ignored at school. The phenomenon is illustrated well by the latest theory of successful education which promotes the equal importance of cognitive functioning (managing attention, cognitive coping, cognitive plasticity) and social functioning (managing behaviour, social coping and behavioural plasticity).

Drivers

- Rising social awareness and sensibility
- Growing popularity of indie games
- New themes being explored by developers
- Need for using games in non-entertainment context

Advantages

- Serious games spread important values and knowledge about the world
- They help one to understand and find one's place in the contemporary world
- They help people learn more about themselves and gain atypical skills
- They force one to think and shape one's beliefs and personality

Challenges

- Their reception could be difficult
- It is harder for the players to experience the flow than in other games
- Games might be rich in ideologies

Examples

- Games for Change Festival
<http://www.gamesforchange.org/>
- Games for Health Conference
<http://gamesforhealth.org/>
- "Papers Please" game
<http://papersplea.se/>
- "The Business Strategy Game"
<https://www.bsg-online.com/>
- "System Danmarc" game
<http://nordiclarptalks.org/transmitting-a-political-vision-through-larp/>
- Serious Games: Mechanisms and Effects (e-Book Google)
<http://www.google.pl/books?id=3HWQA-gAAQBAJ&dq=serious+games&lr=&hl=pl>
- The NYU Game Center
<http://gamecenter.nyu.edu/about/>
- SGA Serious Games Association – international trade association serving the serious games industry
<http://www.seriousgamesassociation.com/>
- "Critical Play: Radical Game Design" a book by Mary Flanagan
<http://mitpress.mit.edu/books/critical-play/>

 *Related Trends*



Social Media Learning



Lifelong Learning



Scenario-Based Learning



Problem-Based Learning



Informal Learning



II. Modern education is fun

EDU-LARP AND DRAMA

EDU-LARP AND DRAMA

Playing a role

Related Terms

Drama, psychodrama, living drama, dramatherapy, drama games, improvisational theatre, jeepform, freeform games, role-playing games, urban game, ASG, parlor larp, chamber larp

LARP is an acronym for Live Action Role Playing. Among the well-known educational tools, LARP bears the strongest resemblance to drama, i.e. a teaching method where the participants play roles and act out fictional situations to be able to understand and analyse their own reactions or broaden the knowledge on a given subject. Drama is considered to be one of the most effective teaching methods. It is based on three pillars: interpreting the role, self-reflection and entertainment. Kolb's learning cycle, i.e. learning through experience, provides theoretical basis for drama. The theory states that the most important element of a drama exercise is the discussion afterwards which stimulates self-reflection and, as a consequence, enables you to draw some knowledge from it.

Although there are many similarities between drama and LARP (lack of division into spectators and participants, interpreting roles, playing characters to achieve a goal), LARP originated in a different area: entertainment. Each LARP is, above all, a game. During the history of humankind,LARPs have taken on many forms: ancient mysteries, renaissance parties or 19th century war games (better known as field games or detective games played mainly by scouts in the 20th century). They evolved when fantasy met pop culture and role-playing games, known as RPG, came into being.

The main difference between drama and LARP is their function. Drama aims at changes and reflection. According to the GNS theory developed in the 1990s, LARP has three types of aims: Gamist, Narrativist and Simulationist. LARP developed with the three categories in mind is a game that can be won (game) that features the best storyline (narrative) and presents the game world, sometimes referred to as diegesis (simulation). Regardless of the form, LARP is the easiest to incorporate some knowledge into. Knowledge may hide behind the characters' stories, their motives and goals, as well as in the diegesis explored by the players. Pop culture provides some help here.

It is not difficult to incorporate chemistry and biology into a game about zombies; astronomy and physics into a sci-fi script, history and geography into a play based on a

picaresque novel. You can also smuggle some knowledge by placing it in elements of the game, such as tasks and quests. They form an inherent part of the story and enable the players to discover all nuances or simply help them win. You have to have some knowledge and skills to solve them and using your knowledge and skills in the game reality is one of the best ways to practise and remember.

Drivers

- Games are being analysed and tuned to serve new purposes
- LARPs develop faster than any other game's genre
- Social skills development tools are more and more necessary at the time of rapidly growing alienation caused by the digitalisation of everyday life

Advantages

- LARP is an appealing tool thanks to scenography and costumes. At the same time, it is not as demanding as, for example, school plays (LARP does not require, or even cannot involve, rehearsals which destroy the suspense of the interactive story)
- LARP presents the educational content in a form that makes it very easy to remember (presentation, discussion, practical exercises)
- The educational goal is accomplished not only through acting out the scripts but also at the design stage

Challenges

- It's difficult to create a good and playable script
- Typical edu-LARP takes 3 to 4 hours
- Children and teenagers are not used to activities that require frequent improvisation and open behaviour

Examples

- A school where all classes are conducted in the form of LARP or role-playing games <http://osterskov.dk/om-os/osterskov-in-english/>
- LARP programs for schools by Seekers Unlimited <http://seekersunlimited.com/>
- Education-Larpers International Network <http://www.edu-larp.org/>
- Pervasive games <http://pervasivegames.wordpress.com/>
- Gamified drama <https://prezi.com/wsm34suwtw4/gamified-drama/>
- LARP wiki http://nordiclarp.org/wiki/Main_Page
- A collection of LARP publications <http://larpbases.pl/?cat=205>

 *Related Trends*



Peer Learning



Informal Learning

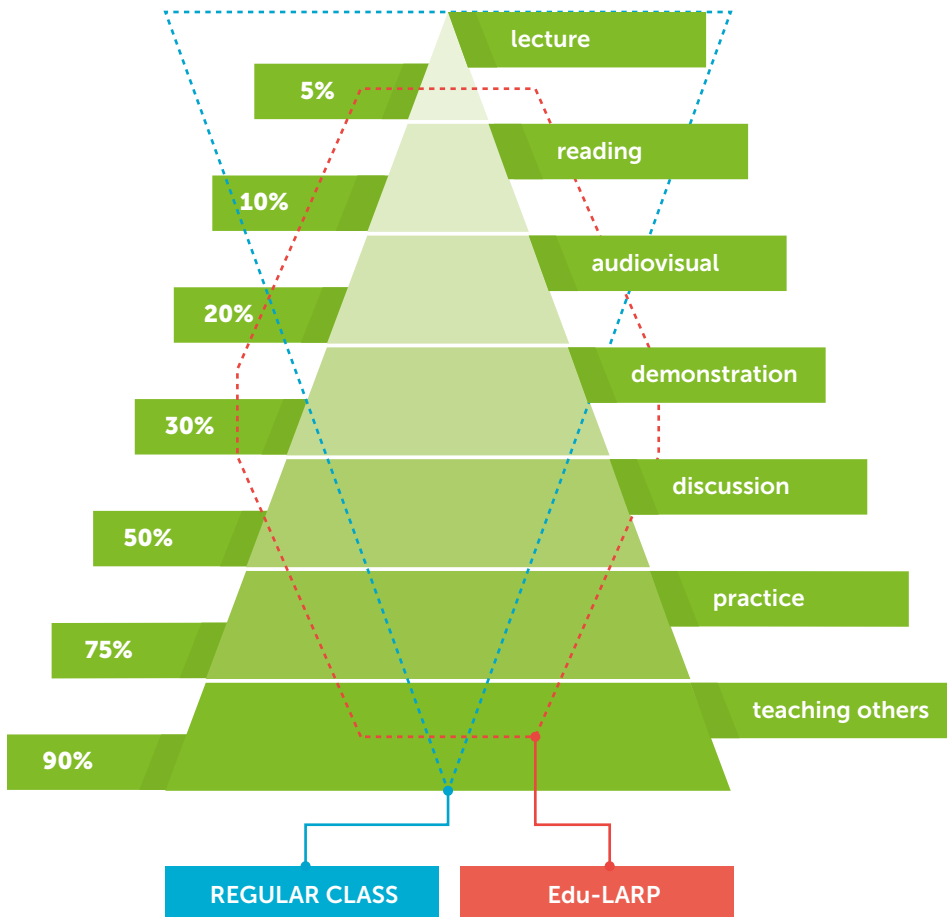


Flipped Classroom



Scenario-Based Learning

Average student retention





II. Modern education is fun

OUTDOOR EDUCATION

OUTDOOR EDUCATION

> Learning in the open air <

Related Terms

Classroom without walls, educational and ecological initiatives, experimental education, culture of fear, green learning initiatives, nature deficit disorder, teaching out, cotton wool kids, environmental learning, environmental education, nature education, adventure education, wilderness experience, adventure therapy, augmented reality, urban games

If children were a separate species and we were to assess its population based on the appearance of a backyard, one could think that the species is on the verge of extinction. Playgrounds, improvised sports fields, carpet-hangers, curbs and streets seem deserted. The children are gone. They gave up the real world exploration to explore the virtual one. They absorb knowledge and culture sieved through the new media. Similarly, they communicate with their peers via digital tools more and more frequently. They update a status, tweet their thoughts, send a snap. They edit zero-one gestures, words and looks which will be available in cyberspace for everyone. They are separated from the real world by screens of computers and tablets or a smartphone display.

One can assume that the contemporary lifestyle does not favour outdoor activities. The civilization and technology development makes our lives easier and more comfortable. More and more services are easily available and we don't even have to leave home or the couch. Children are particularly tempted by the possibility of spending all their time in front of a computer which has become a gateway to the world of entertainment and communication with peers. What is more, there is still the safety issue, often misunderstood by parents. They drive their children to school and pick them up to avoid the danger which might be lurking behind each corner. During the weekend, a trip to a shopping centre is a must, instead of an outdoor trip or a walk in the park.

Research has shown that contemporary children spend three times less time playing outdoors compared to their parents at the same age. It is hardly surprising that so many of them suffer from diseases of affluence: obesity, diabetes, allergies, vitamin D deficiency or ADHD. Spending time outdoors is essential for healthy growth – by toughening the body up and providing it with oxygen we ensure that it develops properly. Playing team games with peers favours social development and stimulates imagination, and acquiring new skills improves a child's self-esteem.

Considering the above, we simply have to incorporate outdoor activities in the education process. Not only during PE classes. It's about moving as many classes as possible outside. Mobile technology enables us to conduct lessons anywhere. GPS capability and widespread Internet access opened up new possibilities to get to know the neighbourhood, move around and explore the world safely, possibilities of which we could not have dreamed several years ago. Thanks to tablets and smartphones, a classroom does not have to, and should not, be a place limited by the school walls. Well-organised outdoor classes can be by far more interesting than the traditional ones even though they cover the same subject. They allow for more freedom in incorporating teaching methods which are rarely used or applied on a small scale. Finally, the most important function of outdoor classes has to be named: combining reality with knowledge. The knowledge provided in the classroom often seems too abstract and strange because there is no way students can experiment, observe and examine on their own. Students struggle to find the practical use for such knowledge or even some traces of it. Knowledge requires context. So let's carry it to a place where it will be real – outside.

Drivers

- Dying practice of walking to school
- Spending the entire day in front of a computer screen
- Social media development
- Parents worrying about their children being kidnapped or anything else happening to them, e.g. a dog bite
- Schools focused on students' test results neglect other forms of education due to an overloaded curriculum and limited time
- Broadening the students' intellectual horizons by drawing their attention to the beauty of nature, art and the pleasure they can find in playing games with peers
- Supporting teachers within areas that are difficult to take into consideration in the classroom
- Using and developing various learning styles, in particular kinaesthetic learning
- Improving the ability to interact with other people; supporting the development of independence and social skills (teamwork and leadership)

Advantages

- Encouraging students who lack motivation to learn by showing them ways of acquiring knowledge other than the narrative approach
- Building a relation based on understanding between the student and the teacher
- Making young people engaged in school life to help them become more mature in the school and social contexts

Challenges

- Outdoor education brings about the best results if it's an integral part of a curriculum and will be strictly related to the subjects covered in the classroom
- When selecting outdoor activities, you should make sure that they suit the skills of each child

Examples

- Agriculture and natural science classes with "back to the woods" programme
- Nature trips
- Visiting national cultural heritage sites
- All types of outdoor workshops
- Outdoor adventure activities: climbing, water sports, trekking, caving, archery, driving four wheelers, obstacle race, mountainboarding, integration activities

- Expeditions and excursions

The United Kingdom:

- Council for Learning Outside the Classroom <http://www.lotc.org.uk>
- Institute for Outdoor Learning <http://www.outdoor-learning.org>

The United States:

- Outdoor Ed <http://www.outdoored.com>
- Association for Environmental and Outdoor Education <http://aeoe.org>
- Association of Outdoor Recreation and Education <http://www.aore.org>
- Geocaching game <https://www.geocaching.com/>
- Letterboxing game <http://www.letterboxing.org/>

Related Trends



Mobile Learning



Peer Learning



Project-Based Learning



Informal Learning



Augmented Reality



Agnieszka Bilka

TIPS & TRICKS

TIPS & TRICKS

- Take a look back and think about a time when you played hide-and-seek or paper chase, remember how much fun you had when playing with other children, try organising an urban game with your students
- Play games – there is nothing wrong with that. Try identifying the elements that might be useful at school
- Use games, not only educational ones, during lessons. There are a lot of interesting board games, dice games, card games (e.g. The Settlers of Catan, Story Cubes, Dobble)
- Refer to the students' experience from their favourite games, e.g. ask them to write a description of a game character or give an account of an episode from a role-playing game let them make up their own game world and describe its structure
- Give your students the task of making their own game, e.g. a board game, urban game or a video game. Plan a lesson in the open air; let the real world inspire them
- Try turning your class into a game, award points for all the tasks completed, create a table with results, specify the requirements for each level of the game, award medals. You can use tools such as Class Dojo, Class Badges, habitat RPG, Classcraft
- Ask your students to organise a game tournament – it is an excellent way to practise team work and develop organisational and problem-solving skills
- Increase the dynamics of work in your classroom by using timers, e.g. Classroom Timers, tools for picking names, e.g. Random Name Picker, or dividing students into groups
- Use browser tools to create interactive exercises in the form of games, e.g. hangman, crossword, word search, game show etc., such as Learning Apps, Kahoot or Zondle
- Let your students use their favourite apps to tell stories, write blogs, create photocasts or vlogs on YouTube. Some of them may already have their original works online
- Don't be afraid to use social networks. They are a great source of ideas for new forms of expression, e.g. comics, Internet memes, animations and many others
- Let your students use their mobile devices in the field, taking advantage of their features to collect materials for class, tasks or projects



II. Modern education is fun

CASE STUDY

Location-based games with the application of QR codes

Challenge:

A paper chase, a game which we all know from our childhood, enriched with the use of QR codes, is a great way to bring education outside the classroom.

This simple and mostly free solution offers a wide range of possibilities to make the traditional tasks and riddles more interesting.

Process:

First grade students at a middle school organised an urban game on the occasion of the Family Festival within the area of the school building – Secondary School Complex no.10 in Gliwice, Poland. The aim of the game was to show the participants around the attractions of the event, e.g. a stall with scientific experiments, a lottery, slacklining using webbing suspended between trees and a game of pétanque, and introduce them to the history and current events at the school. There are a lot of interesting facts about the 100-year-old school building related to famous graduates, prizes in sports and education and the history of the school patron. During the game, the participants had a chance to learn more about these facts and remember more thanks to a new desire to discover more. The students worked on the game for three hours at school and a few evenings at homes. They successfully divided the tasks among themselves and a considerable part of the work was done online. Using their own computers, the students had access to and could edit a single file stored on the Google Cloud Platform.

Stage 1: The route

First, the students planned the route in such a way as to incorporate the most interesting attractions. The students, armed with cameras in their smartphones, checked the school building for interesting locations. Then, they chose the best pictures from the photographs they had made. The school website served as a source of inspiration as it offered a few ideas for riddles and locations. The students had an abundance of ideas so only the most amusing ones, those situated relatively close to each other and those essential in terms of everyday functioning at the school were selected.

Route points

Stage 2: Questions/riddles

In the next stage, questions about the locations were formed. For example: "What is the title of the musical shown during the festival?" or "While climbing to the top, you will see a brown cast countenance of an insurgent who is admiring himself in a glass sheet. Do you know what his name is?"

Stage 3: QR codes

The next stage involved generating and printing QR codes that were later put up along the route. A free online code generator was used, available at:

<http://www.qr-online.pl/>

Stage 4: Clues

To make the game a bit easier, a list of clues indicating the location of codes was prepared, e.g. "You will find the code in a key place" (meaning the porter's lodge) or "666 – 276: 3 * 5 = the result is the number of the classroom where you will find the next code". A paper sheet with the clues and space to write in the answers was handed over to the participants at the beginning of the game.

Stage 5: Crossword

The players had to write the answers to the QR-coded questions into a crossword. Only after the crossword was completed was the final message revealed. The crossword was created with the use of free "Learning Apps" software. The aim was to retrace the route as quickly as possible and solve the crossword.

The game

On the day of the festival, the creators of the game were assigned some duties. Some of them "stationed" next to the sports field where each guest, a festival participant, a student or a family member could enter the game as an individual player or join a team. These students also recorded the time the players started the game and the time they completed the route to be able to determine who the winner was. Other students acted as technical assistants for those who didn't have sufficient knowledge of the technology and those who didn't have an adequate mobile device. For such participants, there were student smartphones available "on duty".

The game ended and the winners were announced at the end of the school festival. The prize was a voucher for a barbecued sausage and gadgets.

Effects:

The aims of the project differed according to the group of people who were involved.

When it comes to the students, the aim was to engage them in teamwork to create a game, teach them how to design and use the information and communications technology, search and select appropriate content, solve problems and help them practise a sense of direction – i.e. a range of skills essential in the 21st century. An indirect aim was to introduce the students to the interesting facts concerning the current events and history of their school.

When it comes to the players, the aim was to increase their participation in the event and introduce them to the specifics of the school, the building and its area using this interesting method.

When it comes to the school community, the aim was to create an interesting product – a game which, with small modifications, may be used on future occasions to promote the school and integration activities for new students etc.

The project enabled the fulfilment of most of the objectives. The creators of the game realised that developing a game is more than just a single challenge such as a test, it is a whole process. A few prototypes – the initial versions of the “product” – had to be designed before the final, satisfactory and fun version was born. They also learned that a product requires promotion as that was the missing element – there were fewer people willing to enter the game than expected. The game should have been promoted in advance on a larger scale.

The players had a chance to familiarise themselves with QR codes. As it turned out, the majority of them have not used them before. The assistants who helped the participants to download the app, read the codes and use the devices had their hands full.

To sum up, the chance for a group of students to develop a game for future use of the entire school community made the project take on significance, gave its authors a sense of satisfaction and provided the players with a large dose of fun.

Creating digital stories

Challenge:

The students prepare digital booklets in German using LittleBirdTales and Storybird applications.

Process:

The task is to prepare a digital booklet on a given topic. The booklet should contain a coherent tale or story. The students make use of the pictures they have taken themselves or use those available on recommended platforms. The LittleBirdTales app enables its users to record the narrative to the digital booklet. The students perform the task as a part of the extra project classes or as creative homework. I created one LittleBirdTales account for all students so they didn't have to create their own accounts and could log in using the same password. The Storybird app provides the teacher with the opportunity to create a class so that the students can use a login and password generated by the system.

Effects:

Example 1.

Under the international eTwinning project, students from Poland, Italy and Greece described the day and interests of little monsters they had sewn earlier. To this end, they had to make a series of pictures which were to be accompanied by a one- or two-sentence description. Those who wanted to could record a narrative. This is how a creative story about a day from a felt monster's life was created. The next stage involved reading other children's stories and creating interactive quizzes using LearningApps app on their basis.

Digital booklets presented on Pinterest:

<http://www.pinterest.com/4titania/handmade-deutsch-storytelling/>

As part of the project, my students created a story that helps you remember the use of dative case with prepositions.

For more examples, go to: <http://deutschfun-pielgrzymowice.blogspot.com/search/label/LittleBirdTales>

Example 2.

Students create digital booklets using Storybird on the basis of pictures available on the platform. The pictures serve as an incentive that guides the story and stimulates imagination. The teacher may provide a general topic of the story or give the students a free hand.

Examples of digital booklets created using Storybird:

- Friends "Die Freunde" <http://storybird.com/books/die-freunde-2/?token=qgbm6t6qen>
- Tom the Hedgehog "Igel Tom" <http://storybird.com/books/igel-tom/?token=637jpk53ge>
- Ingeborg's Birthday "Geburtstag von Ingeborg" <http://storybird.com/books/geburtstag-von-ingeborg/?token=8mxu3a93x8>

Creating digital booklets turns students into genuine authors creating stories. From being passive participants they go on to become creators and develop their media competencies. The students can create digital stories individually or in small groups, which will help them become more patient and responsible and show them how to work with others.

Finding a way to influence student behaviour

Challenge:

In Poland student behaviour is evaluated during classes, breaks, at the school canteen or on the sports field. Usually it's spoken evaluation, information which disappears without a trace after a short time. What is recorded in a student's contact notebook is usually the negative evaluation, something that I would like to put an end to.

My goal was to influence student behaviour by applying the positive reinforcement system.

Process:

I found an app on the Internet at <http://www.classdojo.com/> that serves to influence student behaviour. The app has been translated to a large extent into Polish and its use should not cause problems neither to students nor their parents. I knew that Class-DoJo would appeal to children because the characters used are avatars that look like funny and cute monsters. Each child can select its own avatar. After I created a teacher account, I added all my students typing in their names. Then, I asked them to select their avatars and they were clearly thrilled. Together we discussed what kind of behaviour would cause them to gain or lose points. I entered all the suggestions into the interactive register taking care to enter more positive reinforcements and ensuring that the requirements are reasonable for each student. The things that were assessed were student's participation during classes, harmonious cooperation with others, willingness to help other students, keeping the workplace in order, extra initiative etc. When the points are distributed, the app emits a sound which is an extra motivator for the students. At the end of the day, we watched the register and analysed student behaviour. The students could not wait for that moment, they exulted over the points gained and did their best in the course of the next day. I also created accounts for the parents to enable those who wanted to take an active part in the experiment to follow the results of their children. The app also offers the opportunity to notify the parents about their children's results by means of reports sent via email or by printing reports presented during a parents' meeting. This can be done at the end of the week or month depending on the arrangements with parents. Since August 2014, the app has a new feature – you may invite other teachers who teach your class to join the register.

Effects:

The effect is a visible improvement in student behaviour, both in the classroom and during breaks. Having established the criteria and behaviour which is evaluated, the students understand the essence of such evaluation and consider themselves as the creators of the system. They can influence the marks in the register and as new situations arise they can suggest the addition of new criteria or elimination of those proposed earlier. I react to my students' ideas and comments because I want them to identify with the avatar register.

The fact that the parents can access the register means that we are constantly in touch and we can react immediately to difficult situations. The parents are particularly glad when they see that their children are assessed positively and that I appreciate the efforts their children make.



Olga Nerc, Monika Mizerska

MODERN EDUCATION IS COLLABORATIVE

MODERN EDUCATION IS COLLABORATIVE

The ability to cooperate with others and interact in a positive way is crucial in today's world. Collaboration is not only a hot trend in education but also a characteristic of any modern employee or organisation. However, it's not just a trend; being part of a group is one of the fundamental human needs. For this reason, interaction and cooperation are so natural and at the same time beneficial.

The findings say that, while working together, each of us contributes a portion of our knowledge, skills, experiences, ideas, personality, talents, way of thinking and the exceptional use of different senses. Combining our contribution with others creates a unique so-called "collective intelligence". As a result, teamwork brings more effective solutions to any problem, and any project or goal can be accomplished in a more effective way – faster and with a better outcome.

In this way, the learning process is leveraged – team members learn from each other. They discover how to deal with each other in order to accomplish a task. Social skills are developed naturally in the process – respecting others, supporting, understanding, solving conflicts, adapting to different working styles, distinct thinking and behaviour. All of this is adopted as the opportunity occurs.

Collaboration enables the move from the scarcity of an individual action to the abundance of group work.

Nowadays you can see various ways of cooperating in education: social media, flipped classroom, peer to peer learning, project-based learning, open source learning, interdisciplinary education and many more.

Let's dive into the richness of collaboration.

Top benefits of collaborative learning



addresses learning style differences



develops higher level thinking skills



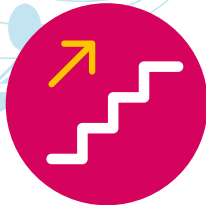
encourages students to take responsibility for their learning



enhances students' satisfaction with the learning experience



develops social interaction skills



sets high expectations for students and teachers



resembles real life situations



develops empathy – the ability to view situations from others' perspective



develops oral communication skills



helps students stay on task easier and be less disruptive



promotes a positive attitude towards the subject matter



promotes innovation in teaching and classroom techniques



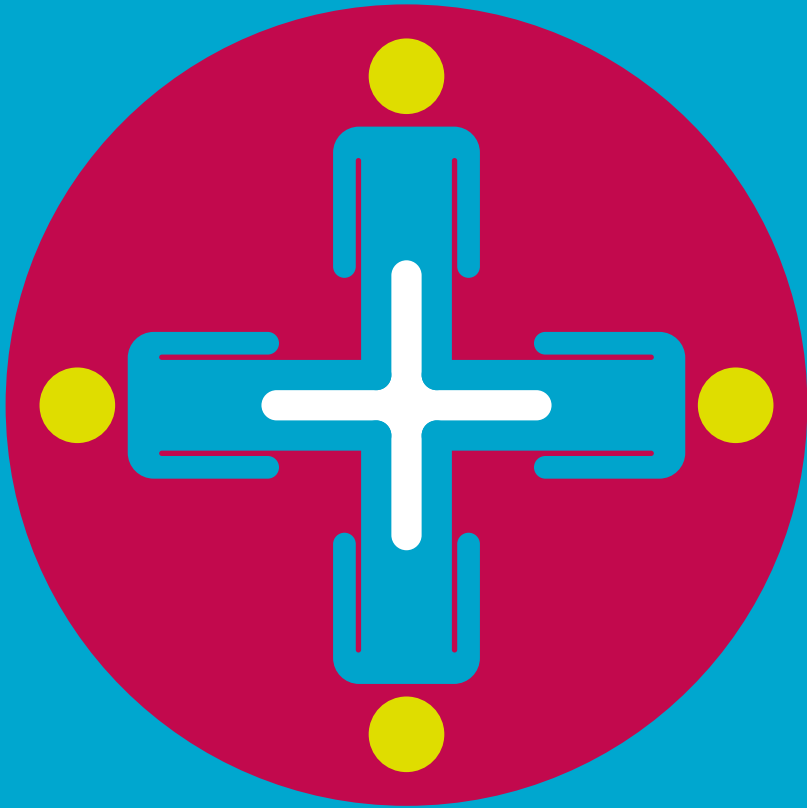
„No one can whistle a symphony.
It takes a whole orchestra to play it.“
—H.E. Luccock

Chapter introduction

1. Peer Learning
2. Social Media Learning
3. Problem-Based Learning
4. Project-Based Learning
5. Edutainer
6. Flipped Classroom
7. Open Source Learning
8. Interdisciplinary Education

Tips & tricks to make teaching & learning collaborative

1. Case Study: Preparing an educational guide in teams
2. Case Study: A briefcase of infinity
3. Case Study: Drama OnLine
4. Case Study: The GUMISIE project – students teach younger students, i.e. interactive German lessons
5. Case Study: The Dot Day as an example of project work
6. Case Study: The application of an educational platform for cooperation and spelling practice



III. Modern education is collaborative

PEER LEARNING

PEER LEARNING

> Where one teaches, two learn <

Related Terms

Peer learning, peer-to-peer learning, peer-assisted study sessions, peer tutoring, peer instruction, study groups, peer-led team learning

Peer learning is a cooperative learning method in which there is no strict division between “those who know” and “those who learn”. Its primary condition is the equal status of all participants.

Everyone involved in the learning situation has an equal chance to learn from each other, being focused on the same topic. All participants are free to ask any questions, to explain their viewpoints, to discuss issues.

The main peer learning principle is to share knowledge acquired from one’s experience, without theoretical information. All participants share their experience in a given subject, compare it with the challenges others have and conclude, building their expertise.

Peer learning requires much more commitment and proactivity than traditional methods. But it also rewards with an opportunity to concentrate on the practical aspects of any subject. This allows finding solutions and answers through cooperation.

Peer learning may take place as face-to-face contact, via social networking or during special events promoting such forms of learning. The educational environment in those situations is friendly, without the stress caused by adult supervision. People enjoy learning new things from a friend who is an authority in a given area.

In this form of learning, the “lecture” may be interrupted with questions concerning the subject. This helps students make sure whether they have properly understood the material. They can also work with two or three other people and take their time to think, discuss and formulate the correct answer. The above-described method is very popular in academic and vocational education as well as professional training.

Drivers

- Stress connected with a typical school environment
- Shared objectives, common threats and pressure
- Easy contact with another person

Advantages

- Learning through teaching – better understanding of certain notions; research has proven that teaching others allows the “teacher” to understand an issue thoroughly and retain the matter in memory. There is no better way of acquiring knowledge
- Increase of students’ interest, improvement of their self-esteem
- Immediate feedback on what works and what doesn't

Challenges

- Difficult management and control, lack of control
- No certainty concerning the actual relevance of the discussion topic

Examples

- Hole in the wall by Sugata Mitra <http://www.hole-in-the-wall.com/>
- Victoria University (VU) in Melbourne, the introduction of peer learning methods and mutual student support model are the elements of this university's leading strategy (Students Supporting Students Learning) <http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1013&context=ajpl>
- Peer Instruction at Harvard University by Eric Mazur <http://mazur.harvard.edu/education/educationmenu.php>
- BarCamp conferences <http://barcamp.org/w/page/402984/FrontPage>
- The World Cafe Community <http://www.theworldcafe.com/>
- CloudCamp <http://cloudcamp.org/>



III. Modern education is collaborative

SOCIAL MEDIA LEARNING

SOCIAL MEDIA LEARNING

> We are all social beings <

Related Terms

Informal learning, social network learning, personal learning networks, social learning environments, social learning platforms, online collaboration tools; Facebook, Twitter, Flickr, MySpace, Pinterest, LinkedIn, Google +, Friendster, Hi5, Orkut, Digg, Badoo, Net-Log, Instagram, SlideShare, Prezi

Social media learning along with online cooperation tools is a trend in education that makes use of Internet communication to share materials and knowledge, cooperate and inspire one another.

Social media or technologies used by social media promote conversation, discussion and learning from others. This is related not only to student-teacher but also to student-student or teacher-teacher and even more parent-teacher-student cooperation.

For technology to be defined as "social", it should fulfil at least one of the following criteria: enable content sharing encourage cooperation and facilitate formal as well as informal learning.

When we talk about Internet communication technologies used by social media, we mean blogs, social network websites such as Facebook, Twitter, Flickr, Pinterest or LinkedIn, websites dedicated to file sharing such as SlideShare – for sharing presentations, YouTube, Vimeo, Vine – for sharing videos or the entire set of Google applications and Elgg – an open source-type software for organisations and individual users. It allows users to create their own online platforms with options of blogging and microblogging, file sharing, creating forums, work groups and numerous other functions. Another form of social media is a podcast which helps to share audio files (lectures, books, presentations, music, talk shows) online via RSS 2.0 feed.

Drivers

- Diversity and accessibility of materials on various subjects; people love to share their point of view with others and discuss different topics, from the methods of solving mathematical problems, to psychology of adult behaviour, to gardening and travelling
- Social media is flooded with intellectual junk, but, on the other hand, there are also serious, academic or strictly scientific publications, which serve the same purpose as traditional trade journals did in the past

Advantages

- Instead of traditional school newsletters, educational institutions may write blogs, activate students interested in politics, music, mathematics or sport and encourage them to write about their hobbies
- Since the education aim is to share knowledge and experience, social media, just like any other communication channel, may increase the learning effectiveness and knowledge assimilation. We should therefore find creative methods of using social platforms to boost the effectiveness of learning
- Social media learning may be used in the case of e-learning courses in structured forms

- Social media are an easy way of communicating anytime and anywhere
- They increase the students' involvement, interest and creativity in learning
- They have a positive influence on building better relationships and trust between teacher and students
- Online collaboration tools enable many students to work on one assignment at once – they see their amendments, notes, comments, and keep track of their progress in a project

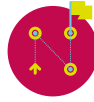
Challenges

- Insufficient linguistic competence impeding the process of knowledge sharing
- Excessive amount of time spent on chatting and browsing irrelevant websites
- Blocked access to social platforms at school
- Presence and the scope of social networks activity at schools is an administrative decision not always dependent on teachers
- Initially, social networking sites were created to share ideas and thoughts, but nowadays they are primarily used for marketing and advertising
- For safety reasons, not everything is shared and made public

Examples

- Online collaboration tools:
 - Trello <https://www.trello.com/>
 - Yammer <https://www.yammer.com/>
 - Red Pen <http://www.redpentool.com/>
 - GoVisually <http://www.govisually.com/>
 - Google Docs <https://docs.google.com>
 - Microsoft SharePoint
 - Screenhero <https://www.screenhero.com/>
 - Skype <http://www.skype.com/>
 - Google Hangouts
<https://plus.google.com/hangouts>
 - Snapchat
<https://www.snapchat.com/>
 - and many more
- Khan Academy
<http://www.khanacademy.org>
- Social media applications for podcasts:
 - Audacity <http://web.audacityteam.org/>
 - PodOmatic <https://www.podomatic.com/>
 - Mp3myMp3 <http://www.mp3mymp3.com/>
 - VozMe <http://www.vozme.com/>
 - Vocaroo <http://vocaroo.com/>
 - SoundCloud <https://soundcloud.com/>

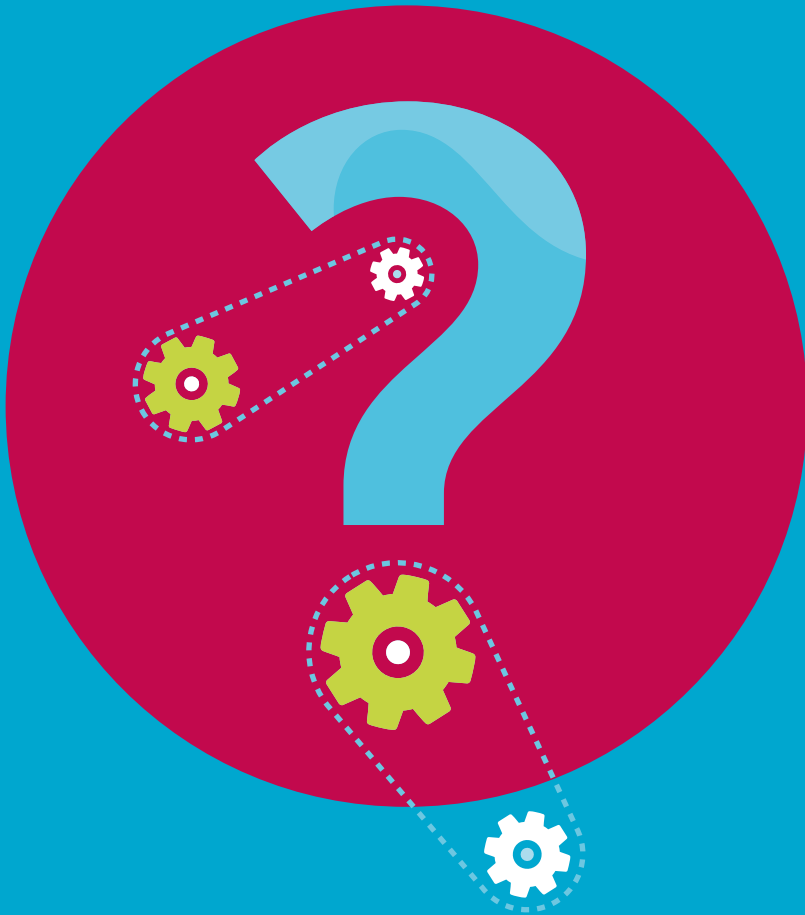
Related Trends



Project-Based Learning



Problem-Based Learning



III. Modern education is collaborative

PROBLEM-BASED LEARNING

PROBLEM-BASED LEARNING

› Discovering knowledge through problem solving ‹

Related Terms

Education based on experience, learning processes, problem-solving, project method learning, open education, constructivist learning environments, self-directed learning – SDL, project-based learning, collaborative learning, discovery learning, inquiry-based learning

To put it in simple terms, in problem-based learning students work either in groups or individually and solve authentic problems selected and delivered to them by the teacher. The greatest benefit of problem-based learning is a requirement for students to be self-sufficient in gaining knowledge and skills, while at the same time they master problem-solving skills required in today's job market. Skills acquired in this way help students prepare to function in society. The best results are achieved when using the problem method in a group, as cooperative thinking often ensures that even the most complex problems are solved successfully.

Similarly to other educational trends concerning the teacher's role, in the problem-based method this role is significant, but the teacher becomes more of a guide, encouraging students to research rather than imposing their own point of view. The teacher's task in this method is to facilitate the course of learning, providing students with problems to work on and solve. It's essential that the problems are important to a given area of knowledge; they cannot be trivial.

While working on problem-solving tasks, students are given considerable autonomy and independence. The teacher will refrain from imposing on students, even subconsciously, external patterns of thinking and acting, making sure that the knowledge acquired at school refers to students' current experience. The problem-solving strategy is thus built upon strategies of memorising and ordering knowledge used by the students.

Drivers

- The learning goal is not only the theoretical knowledge acquisition, but also learning how to put that knowledge into practice and how to use it in social life. Traditional transmission methods do not reach this goal
- Traditional learning strategies force students to gain knowledge in isolation from their current experience
- There is a demand for methods developing the skills of critical thinking, analysing and synthesising content, decision-making, searching and selecting information. The problem-based method fosters the development of these skills

Advantages

- Presents a systematic approach to the learning process, uniting all educational objectives
- Promotes the importance of comprehension in learning, as it's not possible to work in this method without deep problem analysis
- Offers difficulty gradation, allowing students to pass from easier tasks to more difficult ones, from simple to more complex
- Develops consistency in students' work, demanding constant ordering and synthesising of knowledge

- Promotes an illustrative principle of learning, combining abstract with factual thinking, theory with practice
- Supports the knowledge consolidation process, creating new components of the content parts already known to the student
- Develops students' efficiency enabling them to make use of acquired knowledge and skills in new situations

Challenges

- The problem-based method is time-consuming, content acquisition takes relatively more time than using traditional teaching methods
- Teaching with the problem-based method requires a lot of preparation by the teacher: choosing problems and drawing up lesson plans is a laborious task
- There may be difficulties with the evaluation criteria of students' work – this method is not compliant with the current grading system in schools
- Familiarising students with the new form of learning takes time – at the beginning students may feel confused by a less ordered nature of work
- The method functions better with students motivated to work and learn, in groups with lower motivation its effectiveness decreases

Examples

- PBL-Interactive project at the Massey University in New Zealand
<http://pbl.massey.ac.nz/pbl-interactive.htm>
- Problem-Based Learning at the University of Delaware
<http://www.udel.edu/inst/index.html>
- Problem Writing – a Personal Casebook by P.K. Rangachari at the McMaster University in Canada
<http://www.fhs.mcmaster.ca/pbls/writing/index.htm>

Related Trends



Peer Learning



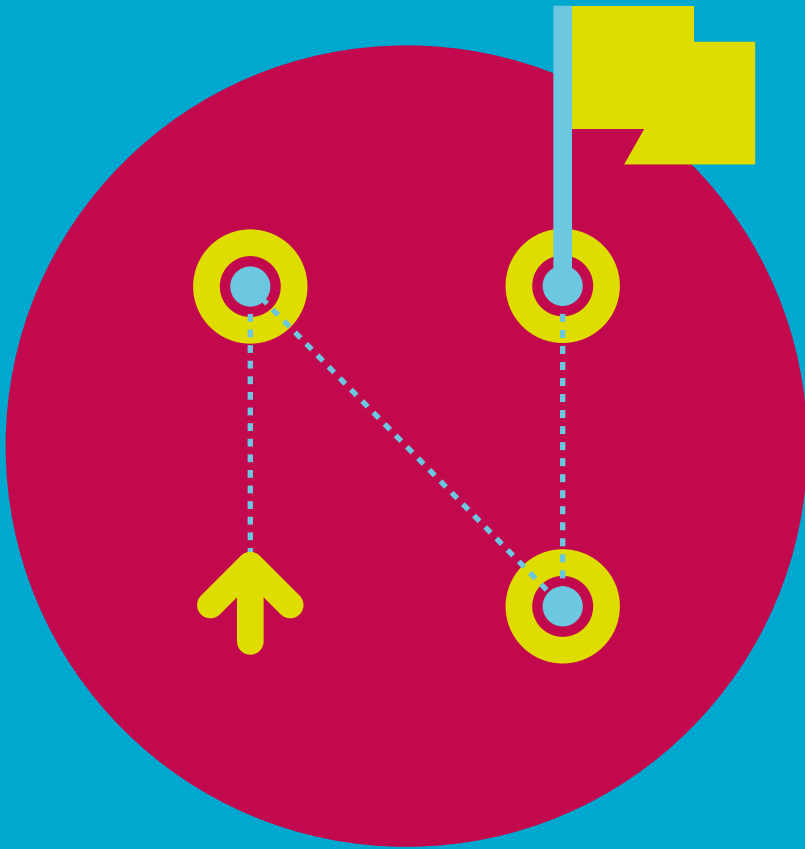
Scenario-Based Learning



21st Century Skills



Edutainer



III. Modern education is collaborative

PROJECT-BASED LEARNING

PROJECT-BASED LEARNING

› Exceptional project called “my life” ‹

Related Terms

Project work, PBL, project approach, project method, project-based science, inquiry-based learning, inquiry-based teaching strategy, collaboration, 4C – collaboration, critical thinking, creativity, communication

Project-based learning is a training method in which students are given fact-based tasks, problems to solve or a particular goal to attain. To get involved in the project effectively, students must use information, their skills and experience and discover new fields and topics. As a consequence they gain knowledge. Each project team member is responsible not only for his own contribution but also for the overall result of the team’s work.

The project method is based on the collaborative learning theory. The differences between these two trends consist of work structure and clearly defined tasks of the students’ group engaged in the project. In the case of collaborative learning, the working team should be small in order to ensure a safe and friendly learning environment. When the project method is used, the group size is not of such great importance.

The project method (known as early as from the beginning of the 20th century) plays an important role in acquiring skills and knowledge by stimulating students’ motivation for creative work. The combination of its effectiveness with the possibilities offered by telecommunication and IT technologies which enable students to work remotely makes productive learning possible in any place and at any time.

Drivers

- Lack of skills necessary in professional life: problem-solving, decision making, critical thinking, taking responsibility for oneself and for the group
- Interdisciplinary knowledge as an essential skill in today's world
- It's impossible to learn analytical and critical thinking in a typical school environment

Advantages

- Better overview of a problem, when it's not artificially divided into mathematical, chemical, historical issues etc.
- Learning skills that are becoming increasingly popular, such as: critical thinking, teamwork, analysis and ordering of information, communication, discussion, presentation of ideas, giving and receiving feedback, defending one's opinions etc.
- Students are truly and personally involved in problem-solving tasks. Learning is efficient – new topics are better memorised and understood by students

Challenges

- PBL is not suitable for standard evaluation and assessment methods
- It may be difficult to strike a balance between learning results and project results

Examples

- WebQuest method webquest.org/
- Project Foundry – Learning Management Tool based on the project method www.projectfoundry.org/
- MakerSpace online community for makers makerspace.com
- Makezine platform for sharing do-it-yourself projects and inspirations makezine.com
- Instructables website with user-created and uploaded do-it-yourself projects instructables.com
- "Invent To Learn – Making, Tinkering, and Engineering in the Classroom" book by Sylvia Libow Martinez & Gary Stager www.inventtolearn.com
- Mind mapping software and platform mindmeister.com
- Glogster online learning platform glogster.com
- MyHistro social memory-bank combining maps and timelines myHistro.com
- Animoto video making software animoto.com
- VoiceThread online media album and collaboration platform voicethread.com
- AudioBoom platform audioboo.fm

- Dipity timelines dipity.com

- Popplet application popplet.com

 *Related Trends*



Relevance-Oriented
Learning



III. Modern education is collaborative

EDUTAINER

EDUTAINER

21st century teacher

Related Terms

Coach, mentor, leader, tutor, trainer, guide, project-based education, pedagogue, counsellor, advisor, scholar, discipline, educator, up-to-date teacher, teacher artist, sage on the stage and guide on the side, flipped classroom, P-route learning, T-route learning

Today's students no longer need a teacher as the main provider of facts: they can access unlimited information on their own, anytime and anyplace. Thus, the role of a teacher in the classroom is changing. They are leaving the central place in the classroom in order to stand next to the students, ready to support them and help if needed. They are more like a mentor and advisor than an omniscient sage.

This also requires changes in the approach to the learning process. Students have to be given a chance to experiment (and fail from time to time), instead of being assessed only on the basis of their test results.

The paradox of today's education is that on every educational level, except as it seems the most important K12, the student is the one who makes decisions about what to learn and chooses the areas of interest and development. In K12, those decisions are made by the system with the teacher in the centre of the educational process. After 12 years, students are all of a sudden expected to take responsibility for their education as this is something that universities and work environment require. No surprise that most of them fail in this and that the educational system is under intense pressure of change. T-route education transforms to P-route education.

In the P-route education model, the teacher's role is to give each individual student, and all students as a group, a possibility to develop skills that allow them to make independent and informed decisions, also those concerning what and how to learn and how to develop their learning experience. Modern teachers, edutainers, need to understand that changes in methods and presentation are required, that teaching and learning methods and materials have to be relevant for today's students.

The list on the next page shows the main differences between P-route and T-route education model.

✓ *T- route* *P- route* ✓

Teacher makes decisions	Students make decisions
Teacher delivers knowledge	Students acquire knowledge on their own
Students consume media	Students create media
Learning environment is competitive	Learning environment is cooperative
Teacher assesses students' work and progress	Students assess their work – peer assessment
Learning is formal	Learning is also informal
The pace of the whole class matters	Everyone can work at their own pace; tasks are personalised.
Learning is subject related	Learning is interdisciplinary
One learning style is preferred	Students are allowed to choose their learning style
Learning in one age group	Learning beyond age groups
Teacher individualizes learning	Students individualize their learning

 *Drivers*

- Student-centred education
- Lack of connection between formal education and the world outside the classroom
- Outdoor education – students go outside of the school walls
- Attempts to make students more independent in the learning process
- Project-based education
- Growing importance of cultural and social trends
- Learning in group and cooperation
- Learning personalisation (focus on problems and individual abilities)
- Learning based on real-life issues
- Increasing importance of practical and creative skills that help in finding a job

Advantages

- Students gain communicative and collaborative skills
- Students learn to manage their own learning process, ask questions and complete tasks without adult help
- Students are more engaged and interested and they participate actively in lessons

Challenges

- Classroom may be noisy and chaotic
- Classroom management may be difficult for teacher as each student is working on something different
- Some students prefer individual work
- New learning models need to be developed
- Teachers lack experience in the new role

Examples

- Flipped classroom
<http://www.knewton.com/flipped-classroom/>
- "The Edutainer: Connecting the Art and Science of Teaching Paperback" by Brad Johnson, Tammy Maxson McElroy
<http://www.amazon.com/The-Edutainer-Connecting-Science-Teaching/dp/1607096137/>

- Khan Academy
<https://www.khanacademy.org/>

Related Trends



Student-Centred Learning



Personalisation in Education



Interdisciplinary Education



Project-Based Learning



Peer Learning



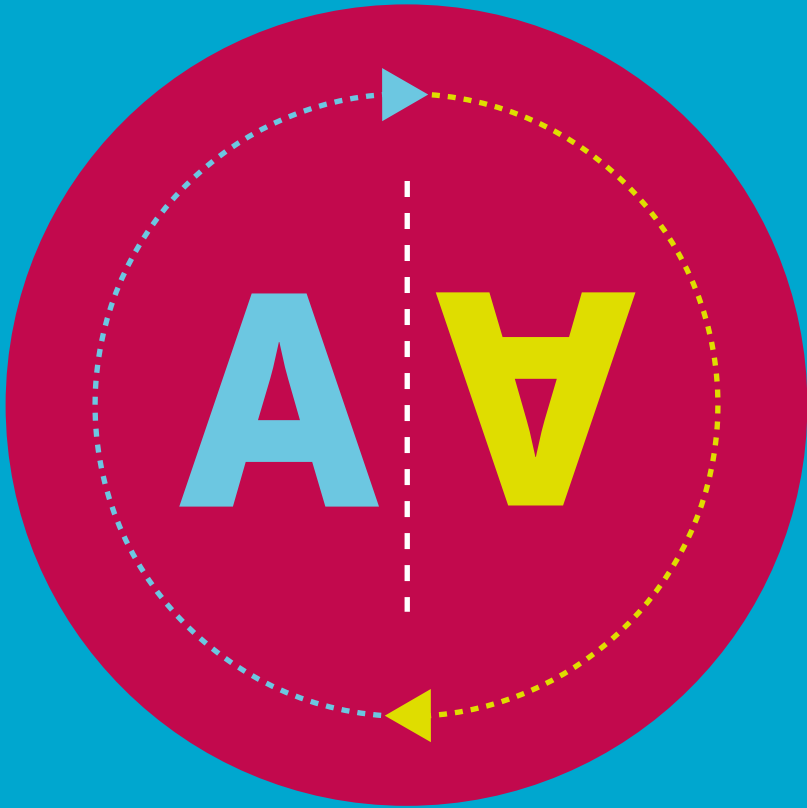
Problem-Based Learning



Open Source Learning



Flipped Classroom



III. Modern education is collaborative

FLIPPED CLASSROOM

FLIPPED CLASSROOM

› Improving contact with the teacher ‹

Related Terms

Flip teaching, reverse instruction, inverted instruction, reverse teaching, backwards classroom, inverted classroom

The “flipped classroom” is the effect of combining and implementing a few educational trends. Since different educational methods are used with a more or less equal result – increased students’ and teachers’ satisfaction, greater involvement and an intensified knowledge acquisition and retention – we have decided to include it in this compilation of trends in education.

The flipped classroom is an example of reversing the traditional approach to the lesson plan. Usually the teacher first introduces a new subject to students, then follows up with exercises and assigns homework. In the flipped classroom, the teacher introduces the subject in a way that allows the student to do some research on it before the actual lesson. This makes the lesson more time-effective, giving the teacher the opportunity to interact with students, answer their questions, solve any problems and devote extra time to practice and discussion.

Drivers

- Poor learning results
- Theoretical introduction to a subject is usually the most boring part of the lesson
- The number of students in classes and the necessity to present the subject, excluded interaction between the teacher and the students
- Constant lack of time for practical exercises
- Encumbering students with many home assignments – especially when they have to do homework after school, when they are tired
- Each student has different knowledge acquiring abilities. It's necessary to adjust the pace of new subjects presentation to individual requirements

Advantages

- More time for practice
- Opportunity to receive answers to questions and to discuss unclear matters
- Possibility to further explore the subject – after the students have learned the basic facts and information
- Opportunity for discussion and student-teacher interaction
- Classroom atmosphere improvement

- Providing time for problem-solving and learning critical thinking
- Forcing some teachers to get familiar with the latest technology
- Teaching how to clarify doubts, ask questions and defend one's opinion

Challenges

- Not all teachers are able to prepare educational materials individually and independently
- The quality and level of recorded materials may vary from one teacher to another
- If the student has not prepared the lesson in advance, he or she will not fully participate in the lesson
- Students may find it harder to concentrate whilst listening to a recorded lecture than during the lesson

Examples

- Khan Academy
<https://www.khanacademy.org/>
YouTube EDU
<https://www.youtube.com/education>
SchoolTube <http://www.schooltube.com/>
TeacherTube <http://www.teachertube.com/>
- Making use of existing materials, such as TedTalks <http://www.ted.com/> or CNN website <http://edition.cnn.com/>

- Screencast-O-Matic
<http://www.screencast-o-matic.com/>
- Schoology
<https://www.schoology.com/>
- VoiceThread
<http://voicethread.com/>
- WikiClassroom
<http://www.wikispaces.com/content/classroom/about>

Related Trends



Open Source Learning



Informal Learning



Peer Learning



Edutainer



III. Modern education is collaborative

OPEN SOURCE LEARNING

OPEN SOURCE LEARNING

› Copying, sharing, reusing – free educational resources ‹

Related Terms

Open learning, free learning, collaborative learning, MOOC courses (massively open online courses), OER – open education resources, open-ness

Open source learning is all about using online resources for educational purposes. All over the world people not only use the inexhaustible collection of resources and tools but, what's even more important, design their own, personalised learning experience. These tailored learning materials are shared with the whole Internet society free of charge.

Open source learning relies on the competencies of today's digital natives, matching the resources availability with discipline-related learning. It allows students to develop their educational experience in a way that suits their needs. Students can work with teacher-mentors, communicate with their peers, cooperate, conduct research online, run blogs and use social media and many other interactive tools. Education based on open software builds a global and universal knowledge database with one main asset – free access. Using this kind of solution is possible thanks to the idea of the Creative Commons licence.

Open source learning does not aim at replacing the development of skills such as writing. Its intention is to use technology in the best way possible. It supports changes in the educational process such as transforming from the T-route to the P-route learning model giving the students the ability to initiate their learning process and be responsible for it, which stops teachers from being omniscient.

Drivers

- Changes in the education system are too slow; it's not ready for the challenges of the 21st century
- Increasing the cost of education, especially higher education
- High cost of educational materials, e.g. textbooks
- Theoretical character of formal education – skills development missing
- Need for widespread access to educational materials
- Interest in free access to knowledge
- Social need to share information, achievements and ideas

Advantages

- Free access to knowledge
- Levelling educational opportunities
- Sharing the knowledge, work and experience not only as a teacher and not only at a school or college environment
- Access to educational materials in diversified forms, e.g. audio or video lectures, presentations, films, photos, graphics or animations
- Permission to copy and edit available resources

- Access to a regularly updated and extended database of materials
- Based on skills and interests of today's digital natives
- Developing skills like cooperation and social networking, allowing learning in an international environment
- Easily accessible anywhere and for everyone – all it takes is Internet access

Challenges

- Lack of control over the quality of educational materials
- Leads to plagiarism in many forms
- Limitations of online access
- Lack of control over student's work – security issues
- Over time, if publishers, authors and other content creators are unable to make money from their work, they will cease to create high-quality learning resources to the detriment of education

Examples

- MIT OpenCourseWare
<http://ocw.mit.edu> (USA)
- Connexions Project – Rice University
<http://cnx.rice.edu> (USA)
- Japanese Consortium OCW
<http://www.jocw.jp> (Japan)
- Learning Space Project
<http://openlearn.open.ac.uk>
(Great Britain)
- <http://www.ted.com/> – source of over 1400 videos with talks by most inspirational scholars and activists related to technology, entertainment and design (USA)
- edX – Free online courses from the world’s best universities www.edx.org
- Coursera – free online courses from the world’s best universities
www.coursera.org
- OpenStax College – free textbooks
<http://openstaxcollege.org/>
- Udacity – educational platform
<https://www.udacity.com/>
- Forums and Facebook groups like Graffika forum and Social Media Facebook group
- epodrecznik – educational platform
<http://www.epodreczniki.pl>

Related Trends



21st Century Skills



Personal Learning Environment



Peer Learning



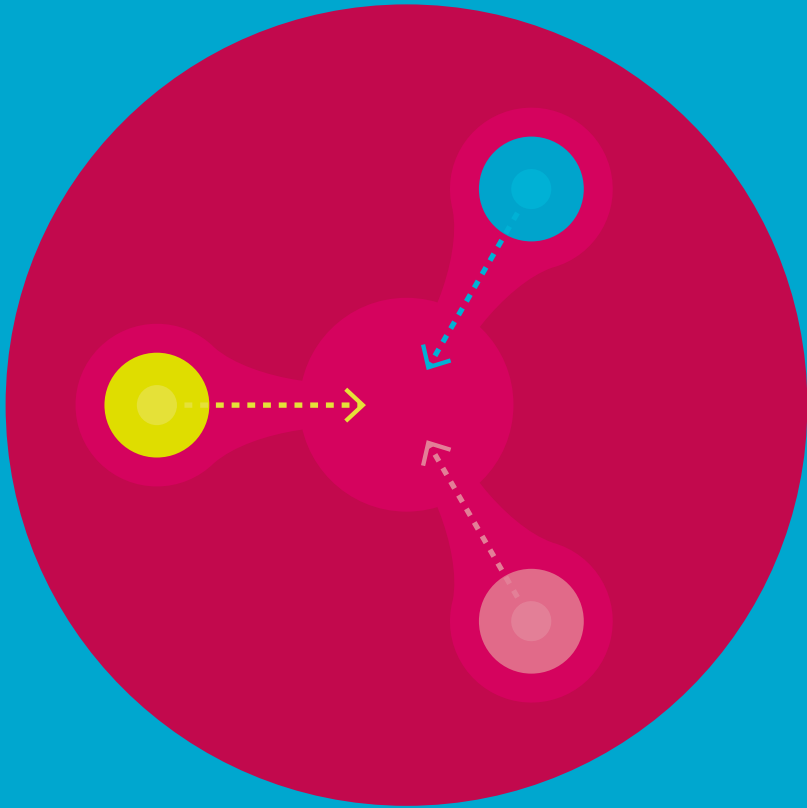
Social Media Learning



Flipped Classroom



Lifelong Learning



III. Modern education is collaborative

INTERDISCIPLINARY EDUCATION

INTERDISCIPLINARY EDUCATION

› Make connections and integrate knowledge ‹

Related Terms

Integrative learning, integrative ability, integrative thinkers, thematic teaching, thematic approaches, thematic learning, thematic instruction, interdisciplinary teaching, interdisciplinary curriculum, interdisciplinarity, interdisciplinary planning

By definition the term “interdisciplinary” means the use of at least two different school subjects or academic disciplines to study a theme, an issue or to answer a question fully, looking at it from more than just one perspective. In K-12 the term “integration” is more common, where “interdisciplinarity” is more often used for academic disciplines.

Taking the interdisciplinary path is not easy from the very beginning and especially during academic studies; we are trained to become experts in our subject. Such an intense specialisation means that we don't see the wood for the trees. Still, the need to connect and integrate facts is a universal human desire and vital element of our intellectual and emotional development. Today's world challenges gave that need a totally new dimension and importance. The mark of our times is a continuous stream of new information which, often without any order or context, flies by our minds without any trace. The ability to reach the unconnected is essential to be able to find one's way in the information clutter. A lot depends on how much we can spot relations among different facts, events, and theories and place them in a broader context, developing a “big picture” of the world around us. That is why the ability to integrate knowledge becomes the key educational outcome. After years of domain-specific teaching and learning, educators are striving to connect defragmented education.

From the workplace to scientific discoveries, to medicine and local affairs, multilevel challenges require an integrated approach. Students have to learn how to be integrative thinkers and apply knowledge that is new to them in non-standard situations: in the classroom, workplace, community and private life. Teaching theories in isolation is being criticised roundly; there is a call for thematic teaching of big ideas and applying knowledge in practice, in real life and real context. A multidisciplinary approach and the ability to integrate knowledge are highly valued in the workplace, e.g. in engineering.

Traditional curricula only list single learning objects, without showing the entire network of connections and relations. And the truth is that this network is important to understand the whole picture and provide integrated knowledge development. Interdisciplinarity can be achieved through designing physical and social spaces where teachers and students come into contact with people outside their subject or discipline in natural, casual social settings. One way of introducing integrated learning to school is creating interdisciplinary teacher teams who synchronise their syllabi around important themes chosen together. A successful integration process has to be conducted on four levels: experience, community, knowledge and integrity with the curriculum.

Drivers

- Need to make connections among different disciplines
- Need to apply knowledge in practice, making it relevant to future professional and private life
- Need to develop critical thinking and reasoning skills in students

Advantages

- Improves students', teachers' and parents' engagement in the educational process – creates an atmosphere of cooperation
- Increases teachers' satisfaction as they see that what they do makes perfect sense in the broad perspective
- Improves students' learning outcomes
- Supports personalisation: students can work at their own pace, in accordance with their interests, skills and experience
- Allows teachers to use time more effec-

tively and discuss themes wider, from different perspectives

- Promotes authentic assessment
- Gives students a chance to work with different information sources, offering a broader perspective than using only one textbook

Challenges

- Teachers and students should choose themes for the interdisciplinary curriculum; they cannot be imposed by any municipality or authority
- May not prepare students for formal assessment
- Broader perspective might be more shallow at the same time, whereas detailed understanding of themes is essential in e.g. medicine, law, engineering
- Both themes and connections among them may be artificial, far from students' experience and knowledge

Examples

- Dr. T. Roger Taylor at the Curriculum Design for Excellence, Inc
<http://www.rogertaylor.com/index.php?src=gendocs&ref=SampleUnits&category=Curriculum%20Units>
- "Interdisciplinary Planning Samples" in "Curriculum for Excellence" in Scotland
<http://www.edubuzz.org/curriculumforexcellence/planning-support/interdisciplinary-learning/interdisciplinary-planning-samples/>
- "Interdisciplinary Learning in Your Classroom" workshop from the "Concept to Classroom" online series
<http://www.thirteen.org/edonline/concept2class/interdisciplinary/demonstration.html>
- The "Interactive Resources for Interdisciplinary Sustainability (IRIS)" project at the Keele University in UK
<http://www.keele.ac.uk/iris/>
- "The Ontario Curriculum, Grades 11 and 12: Interdisciplinary Studies" by MOE in Canada
<http://www.edu.gov.on.ca/eng/curriculum/secondary/interdisciplinary1112curr.pdf>

Related Trends



STEM



VET



Relevance-Oriented Learning



Adaptive Learning



Semantic Web



Problem-Based Learning



Project-Based Learning



21st Century Skills



Social Media Learning



Grzegorz Stunża

TIPS & TRICKS

How to prepare educational materials in a team?

*Advice based on two-day booksprint "(Don't) be afraid of blogs"
organized by Gdańsk Medialab*

- Define the principal aim of the project even before the team meets
- Contact the people you are going to work with and prepare a list of essential threads, ideas and suggestions. To this end, you may use email or an online text editor that will enable you to edit a shared file together
- Lay down the communication rules. Write them down or save them in a file available online to everyone. Ask every participant to sign the document
- Don't get scared by the initial chaos. Organise brainstorming, collect all ideas, consider each and every one of them to be equally important. Then, make a selection by discussing all the proposals with the rest of the team and choosing those which you all consider the most interesting
- Assign a subject to a particular person but take into consideration their willingness to work on it
- In case of any disputes or lack or excess of ideas, let the team have a break and decide yourself what the next steps to take are. Do it in such a way as to avoid offending other people and discouraging them from further work
- Control the progress and discuss the consecutive steps with people who create materials
- Encourage the team members to read the other members' texts, make comments and suggestions
- Allow freedom of expression but make known your expectations for the language to be used. It will be easier to make the entire project coherent
- Don't make anyone wait for the materials. Edit the ones that have already been completed. The idea of booksprint consists not only of writing fast but also of publishing fast



III. Modern education is collaborative

CASE STUDY

Preparing an educational guide in teams

Challenge:

The motive behind the creation of the “(Don’t) be afraid of blogs. The use of blogs in education” guide was the lack of publications on the use of blogging tools in education in Poland. Both when it comes to technical aspects and those concerning the creation and execution of extra educational activities with the use of a blog.

Process:

The time we had to prepare the book was limited to two days. We applied the booksprint methodology used by specialists in various fields, as well as amateurs who wanted to share their knowledge as soon as possible. Booksprint required some preparation before the meeting. As the two project leaders, we specified the principal project goal and invited several people specialising in various aspects of the debated subject to participate. Before writing we organised a brainstorming session to agree on the main subject and details concerning the particular parts of the project. We had to divide the tasks amongst ourselves based on our interests and preferences. When working on individual parts of the book, we used Google Drive. Then, the files prepared by people responsible for particular sections were edited by the two project supervisors.

Effects:

The booksprint resulted in a publication (<http://pracownia.medialabgdansk.pl/#blogi-w-edukacji>) which provides technical information. It also presents ideas for using blogs as tools to complement lessons. Thanks to the use of an online text editor, we all had access to the folder with our files. Everyone could assess the work of others and suggest changes. We could also read the parts that were ready or in the making and adapt our content to the whole project (in terms of style, avoiding repeated examples etc.).

A briefcase of infinity

The use of applications during school classes can't be dictated by trends. If a teacher sees no sense in the use of multimedia, maybe there's no point in forcing it. On the other hand, there are a lot of teachers who would like to make their lessons more interesting, but they are convinced that they would have to pay for the applications and the use of technology and software. They couldn't be more wrong. In this article, I will prove that there is an abundance of free apps which in most cases might be used on an Android phone or a mobile phone with Internet access if a given app is operated from the level of a webpage.

If applied solely as useless embellishment, an app makes no sense and surely there are many Polish teachers who will conclude that lessons based on traditional anthology and devoid of technology will be equally interesting. This is why we should first think about the aim of applying technology during lessons. In my case, it serves three goals.

Firstly, it saves time. Due to the limitation of working hours, completing a given task within one lesson unit, or speaking more generally – realising a given part of material having a predetermined number of hours to teach per year – is a problem for every teacher. You need to save time which you normally devote to arrangements and systematisation to be able to spare more time for creative work. There are tools which will help you divide the class into teams (Teamup, IDroo) or make decisions when you work on a project (Conceptboard, Lino). If you want to intrigue students, you could give them a coded task at the beginning of a lesson. Generating QR codes is extremely easy with the QrDroid app. A warm-up at the beginning of a lesson often involves asking for definitions based on associations. For this kind of revision, e.g. on speech parts, you can use word clouds (Tagxedo, Wordle). When working in teams, the students usually have only one copy of instructions available. In this case, you could encourage them to use Lectures Scanner – using a tablet camera, it scans a document and enables you to use (underline, make notes, send to others) a separate copy. The last app which I use to save time is Padlet which serves to create databases dedicated to a given subject in the form of virtual boards. It enables me to quickly go back to the things that I prepared earlier.

The other types are the applications which I refer to as the “activators”. They are connected with the art therapy idea in its broadest sense and the concept of intersemiotic translation. Its aim is to make students more creative on one hand, and on the other, to increase retention through content retransposition and activation.

When it comes to Polish classes, apps are supposed to enable students to face the storyline in a different way. In order to verify the understanding of longer texts, you can ask the students to prepare a booklet (either an abridgment – Littlebird Tales – or a presentation of a single motif, or a continuation – Storybird). Manipulating the book content requires the teacher to provoke students to look at the problem from a different perspective. You can encourage students to treat the content as a bombshell to be used by meticulous reporters (i.e. your students) who write an account of the Grunwald Battle, an interview with Kawka's neighbours (a character from "Labors of Sisyphus") or a report on the visit at the institute ("Brave New World"). To this end, my students create e-papers (published on Issuu), process the materials from lessons or make their digital representation with the use of the puzzles-text method and posters as a means of revision (Glogster). In the case of younger students, working on plots with multiple motifs is successful if I ask the students to, for example, present a given motif in a comic or an interesting animation (frequently used apps include PowToon, PiZap and www.makebeliefscomix.com online app). The application that I use the most is PicCollage. It's an excellent tool to prepare work on an account, report or a column. Any kind of action – a trip or a school event – is suitable to collect materials. It's enough if the students take a few pictures in the course. Thanks to PicCollage you can create a nice poster as a summary of the outdoor activities, which may give grounds for a more complex journalistic work.

The third group of applications intends to aid the retention of information and skills. During my revision classes I use RealtimeBoard and Mindmup, while for group projects I use moodle type tools (Edmodo). You can alleviate the stress connected with testing knowledge by introducing interesting forms of quizzes (Kahoot, Web Quest Google – e.g. on "Pinocchio" or "The Knights of the Cross"). For summarising, revising and publishing the work of a team (that works on a project or some tasks) you can create an effective slide show (Slidy.ly) or a screencast that can be later published on a class or school blog (Clarisketch app).

It all points to a logical conclusion – a contemporary teacher's briefcase is not full of didactic materials but heads towards infinity. But we need to make sure that such infinity is a functional whole, and not a set of good-looking gadgets.

Drama OnLine

Challenge:

The original Drama OnLine educational method was inspired by the need to put an end to the students' thoughtless and illegal habit of copying and duplicating content found online. Another reason for its creation was the willingness to work in the teenagers' beloved environment, i.e. social networks such as Facebook, or in the competitive and rewarding environment of online games. The method refers to the blended learning system and it was developed on the basis of the well-known and popular traditional drama.

Process:

The classes are either face-to-face or held online according to the blended learning system. After being introduced to the rules and instructions for use of the Edmodo platform where the whole process will take place, the students draw for historical figures that they will play using the platform. At this stage, the teacher's role is limited to presenting the rules and platform mechanisms or providing help in creating a user account (it's important that parents be informed about the process and give their consent as it can be included in the evaluation criteria of a given class). The success of the action depends on the choice of adequate historical figures according to the selected subject and time period or the planned project operations. In the next stage, the teacher becomes a moderator and a mentor. For the project duration of minimum two weeks, the students play their roles and realise the established goals such as: developing an account, creating a digital portfolio, creating their own avatar using Voki, discussing subjects/tasks indicated by the teacher, interacting and sharing ideas. The students prove theses which they came up with earlier, they correct their own mistakes and act according to the netiquette. Their actions are rewarded with medals/awards which represent a specific activity such as a biographer, a battle-painter, a journalist, a discoverer etc. Each medal is worth a specific number of points. When the points and medals are summed up, the students' positions within the project group are revealed. At the end, everybody meets online to create a large mind map – a "booksprint" using Google Conceptboard app – corresponding to the topic of the project.

Conclusions

The Drama OnLine method forces the students to use the Internet in an unconventional way. While playing a historical figure, they are forced to analyse and process all the information they publish. For example, due to the fact that the online text is written in the third person while the drama requires the first person, the simple act of copying the content is not enough. The method enables one to manage larger portions of material in an interesting way and in the students' favourite environment.

Benefits

The principal aim is to develop information society competences and key competences such as reading comprehension skills, searching and selecting information, IT skills, as well as language skills by using applications based on English. The method can be easily employed during other classes, e.g. Polish classes (simulation, playing literary characters) and is not limited to the humanities. Projects carried out with the use of Drama OnLine don't absorb students and teachers at school and the gamification nature of the method makes it very easy to learn for the students.

Achievements

The students gain a range of essential skills. While winning medals and points they learn what healthy competition is about and how to develop their digital portfolio in the future. The fact that they can use mobile devices and do their work at any time makes the method even more attractive. I noticed that my students have significantly broadened their knowledge and skills when it comes to the use of the app and the educational platform. By pretending to be a historical figure, they learn what their strengths are, which can be observed during online conversations.

The GUMISIE project

– students teach younger students, i.e. interactive German lessons

Challenge:

The starting point for the project was conducting three interactive demonstration classes for the sixth grade students at the elementary schools in Pawłowice, Poland. It was a part of an action promoting middle school and the application of high technology in education. Another goal was to convince younger students that German is not as difficult as everybody thinks as well as to show the teachers the ways they can use an interactive whiteboard and free online resources. The lessons were prepared and conducted by middle school students who made extensive use of high technology. One more important goal was to take the lessons outside of the school and show how to take advantage of free apps to make lessons more interesting.

Process:

The project was prepared on the basis of the Lernen durch Lehren (learning by teaching) method which I use during my German classes. It involved two middle school third graders. Both girls like to employ high technology in learning. They found apps and Web 2.0 tools that make the education process more interesting and, above all, increase its efficiency and raise student motivation.

The project lasted from September to June and involved conducting interactive lessons for the sixth grade students at the elementary school situated one floor below. The students set up a blog (www.gimnazjumuczy.blogspot.com) and came up with the name for the project – GUMISIE – an abbreviation for Gimnazjalistki Uczą Młodszych I Się Interaktywnie Edukują (Middle School Students Teach Younger Students and Educate Themselves Interactively). On the blog, the girls gave an account of each lesson they'd conducted and published a presentation and all interactive exercises they'd prepared. Each lesson took 45 minutes and took place on average once a month. The classes were based entirely on interactive activities and activating methods. The students didn't have to sit at a school desk nor did they get any obligatory homework. Each lesson followed a fixed pattern: at the beginning, new vocabulary and language problems were introduced, then there was a revision of the material which had already been covered and, finally, the students worked on memorising new terms and issues. The girls used all the tools and apps helpful in prac-

tising language skills: writing, reading, speaking and listening. They selected the content for each lesson on their own. The teacher (me) acted as an advisor-mentor.

The girls gave a demonstration class to teachers at the "EduZmieniacze" ("EduChangers") conference in the School Complex no.6 in Jastrzębie Zdrój, Poland and prepared a presentation at the "W stronę Cyfrowej Szkoły" ("Towards a Digital School") conference in Pszczyna held by Omnibus Association.

Effects:

The girls achieved great success as teachers. They were very creative and their lessons were very popular amongst the sixth graders who were eager to attend each of them. They learned to work together, divide the tasks and select content adequate to the practised skills. Each exercise had a specific educational goal, it inspired thinking and searching for new solutions. The classes made sixth grade students prepare materials for other school subjects in the form of interactive presentations, quizzes and games. In the final evaluation, they concluded that interactive lessons helped them learn in a pleasant and efficient way. The students now attend first grade at the middle school and the material they covered earlier doesn't pose a problem for them. They learned to be creative and motivated. They now use the Internet to learn and teach consciously.

The Dot Day as an example of project work

Challenge:

The International Dot Day is celebrated on 15 September in schools, libraries and cultural centres all over the world. To join the celebrations, you have to register at <http://www.thedotclub.org/dotday/>. In 2012, I had a chance to celebrate it with my students. The idea seemed so significant that I decided to spread it around and get other teachers involved in other parts of Poland. This is how the idea for a project realised with several other teachers and their students was born. I wanted to show others how important it is to cooperate and learn from each other.

Process:

Upon presenting all the assumptions and the idea behind the project, I created a Google document that everyone could access with a plan to be edited by all the partners. We shared our ideas and links to interesting online resources that could be useful during classes. For some teachers, this was the first contact with the cloud and learning in the virtual reality. Middle school students added subtitles to a film about Vashti. A teacher from Szczecin did the translation. It was genuine cooperation of many people based on new technology. All the events celebrating the Dot Day that took place at schools in the course of a few days were documented on the blog: <http://kropka-dot.blogspot.com/>. The students could monitor what was happening at other schools, comment and get inspired. Everyone had tasks to fulfil – completing an interactive map, preparing illustrations for a booklet or preparing pictures of the classes participating in the event. Both students and teachers willingly performed them. You can see the effects on the blog.

Effects:

Thanks to the actions taken to celebrate the event, we were able to have fun and learn together. The teachers learned how to prepare tasks for their students using online resources. They learned how to publish a blog entry and presented the results of their students' work using interesting ICT tools about which they learned during the short project. Finally, the work was evaluated and we decided to continue this celebration of creativity, friendship and talents in the following years.

The application of an educational platform for cooperation and spelling practice

Challenge:

Ms. Ewa Górnicka from Opole, the creator of a course entitled “Spotkania z Pyzą” (“Meet the Dumpling”) invited me to use the platform. The course was divided into monthly modules and the tasks were related to the subjects realised during regular classroom work. The exercises selected were supposed to motivate our pupils to make an effort and develop their creativity. The best way to achieve these goals was teaching through play, i.e. enriching the process of teaching how to spell with interesting intellectual entertainment, games and tasks as well as incorporating ICT tools into the process.

Process:

Each month, the pupils had similar tasks to complete – play educational games we selected and, at the end of the module, add a task which provided a summary of the acquired spelling skills. At the end of the module, we also ran a dictation test to verify the students’ progress. We didn’t have to provide any instructions for the tasks. We chose simple tools that didn’t require logging on. The students learned how to create speech bubbles in the Wordle application, word mosaics in the Imagechef program, games on Zondle, puzzles in the Jigsaw Planet and they recorded their tasks with the use of the Vocaroo application. The parents created accounts on the Moodle platform. They were notified about new tasks and could check the results and the points scored. When children achieved a specific number of points, they received prizes – spelling stickers. The most interesting part of the work on the platform was the possibility to observe and comment on other students’ work. It favoured new friendships and helped the children understand netiquette. Searching through a map they found the town from which their partners in the “Ortografia w chmurze” (“Spelling in the Cloud”) project came. The Moodle platform is a safe place for pupils of all ages. Course materials are easily available at all times.

Effects:

Our work resulted in the creation of materials not only by teachers, but also by students. We used those materials on numerous occasions even in the third grade. The pupils learned netiquette and used it easily and consciously in practice. When turned into play and cooperation, tedious spelling exercises became attractive activities. The possibility to score points and receive comments from observers increased the motivation to complete each task and start a new one. Here are some examples of the works:

<http://www.jigsawplanet.com/?rc=play&pid=105c491f23a6>

<http://myclass2c.jimdo.com/wordle/>



Monika Mizerska, Przemysław Chyrk

MODERN EDUCATION IS RELEVANT

MODERN EDUCATION IS RELEVANT

An alarming situation has been noticed recently: more and more youngsters are leaving schools without skills, knowledge and competencies critical for a successful life, both personal and professional, in the ever-changing reality of the digital age. People all over the world migrate looking for new job opportunities since there is no place for them in their local communities. The reason is that the skills and knowledge students gain in schools are no longer relevant.

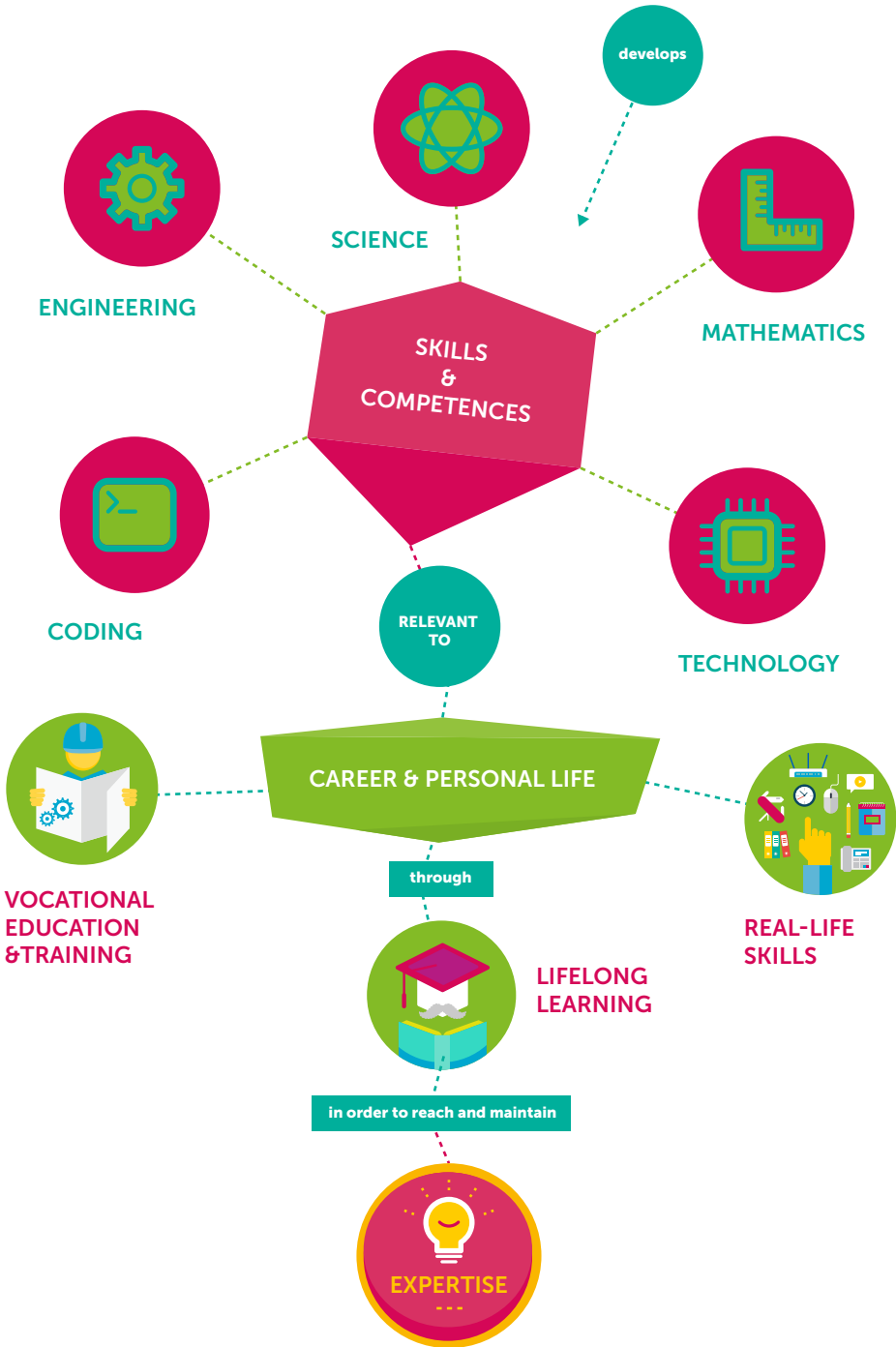
School cannot differ from the real world – students want to know that what they are learning is intentional and has a purpose in their lives. They should also learn in pretty much the same environment that they live in on a daily basis. The education they are offered should be first of all relevant to their needs, secondly relevant to the requirements of the job market and thirdly to the local culture reality.

Such education providing real-life skills, promoting STEM and vocational training is vital to the well-being and progress of not only every individual but also every society. It has to provide transferable abilities, encourage critical thinking and innovation and support student's individuality and talents.

Discovering the connection between educational content, experience and previously learned material has an enormous influence on each student's interest and motivation to learn and succeed in reaching their goals. Using cultural references is just as important to impart to students' skills, attitudes and knowledge – it creates a bridge between their home and school lives.

Today's graduates lack expertise, and expertise is derived from experience. It takes around ten years to become an expert in a work-related domain and no organisation has that much time. New ways of gathering expertise outside of a normal job are necessary. We need a public-private partnership to offer students internships and apprenticeships and allow them to prepare for the challenges of today and tomorrow.

RELEVANT EDUCATION in the 21st century



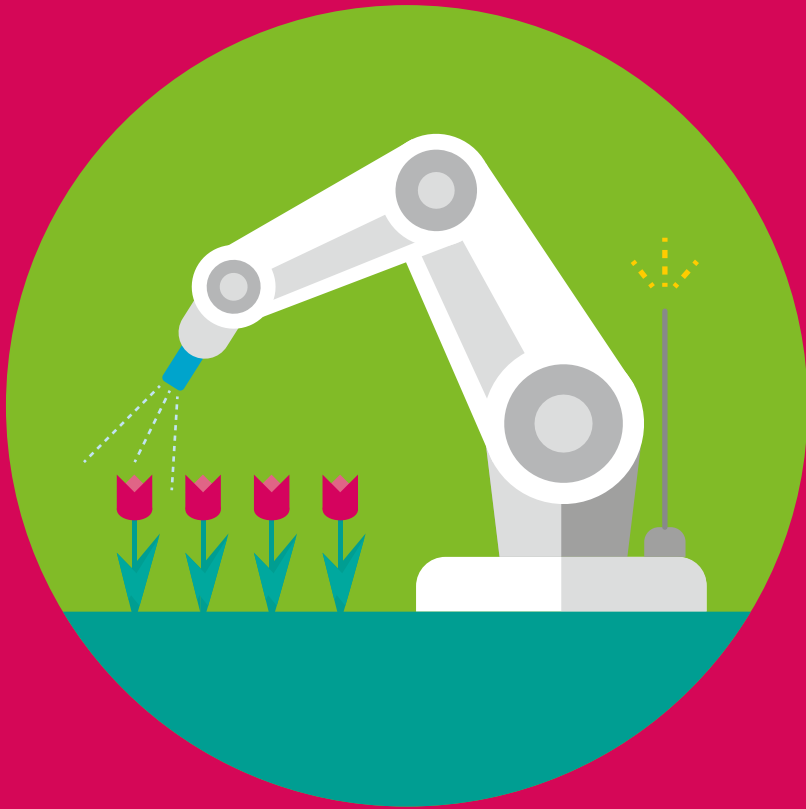
IV

Modern education is relevant

1. Science, Technology, Engineering and Maths
2. Vocational Education and Training
3. Lifelong Learning
4. Informal Learning
5. Relevance-Oriented Learning
6. Learning to Code
7. Competence-Based Learning
8. Scenario-Based Learning (SBL)
9. Real-Life Skills
10. 21st Century Skills

Teaching tips & tricks to make teaching & learning relevant

1. Case study: Learn programming to be able to teach your students
2. Case Study: Using new media in work with adults
3. Case Study: The Needle Felt the Thread, i.e. an inter-school avatar campaign



IV. Modern education is relevant

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS

› Structural changes in teaching to support innovation ‹

Related Terms

STEM, science education, technology education

STEM is an acronym for science, technology, engineering and mathematics – four basic disciplines essential for the development of current and future technological innovation. The acronym was first used in the educational programmes of the National Science Foundation (NSF) in USA. The reason behind such an initiative was the lack of qualified candidates for employment in the advanced technology sector. There was also concern that STEM subjects were being taught in isolation, out of line with the need for an integrated education system.

Effective STEM education arouses interest and influences students' experience from an early age. It helps identify their skills and knowledge, activate their mathematical and scientific thinking while they gain practical skills, and sustain their interest in science, mathematics, and technology in the future. The key elements that contribute to effective STEM education are educational standards, curricula and well-qualified teachers. Testing and evaluation systems are also very important in supporting the educational process, as is equal access to high standard teaching for all students.

Innovation is the driving force for developing the economy. But it's not possible without well-educated, dynamic and motivated professionals who have extensive knowledge of science, mathematics and technology. What's more, the requirements of the job market change constantly. Today, the practical knowledge of technological processes, mathematical and scientific thinking, and problem-solving abilities are mandatory in most professions. This puts a necessary emphasis on mathematical and scientific subjects in

education. As humanity continues to develop new technologies, broaden its knowledge, and explore new areas, the number of new professions where STEM skills are required is growing.

In today's world, many decisions made each day are both personal and social (such as the interpretation and comprehension of research results and the management of daily activities using many computer applications) which requires a certain degree of STEM knowledge and thinking.

Drivers

- Development of technology
- Innovation as a key factor of economic development
- Constantly increasing demand for STEM workforce
- Basic STEM skills required in all professions

Advantages

- Increase in the number of employees with STEM knowledge and skills
- Raising the basic level of STEM knowledge in society
- Potential for greater participation of women in science and technology-related areas
- Development of positive attitudes in society towards STEM subjects
- Preparing students for lifelong learning
- Improving the quality of resources used for teaching STEM subjects

Challenges

- Difficulties in the recruitment of highly-qualified teachers of STEM subjects
- Difficulties in the coordination of activities and cooperation of STEM-related groups between organisations such as job centres, economic development organisations, school inspectorates and other educational institutions, universities and colleges, scientific and technology centres and organisations, informal education providers
- High expenses of necessary school infrastructure (computers, materials, laboratories etc.)

Examples

- The STEM Education Coalition
<http://www.stemedcoalition.org>
- Defined STEM
<http://www.definedstem.com/>
- STEM Education Institute
<http://k12s.phast.umass.edu/stem>
- PBS LearningMedia
<http://www.pbs.org/teachers/stem>
- U.S. News & World Report
<http://www.usnews.com/news/features/stem-education-center>
- The White House Blog
<http://www.whitehouse.gov/blog/2010/09/16/changing-equation-stem-education>
- The Center for STEM Education at Northeastern University
<http://www.stem.neu.edu/>
- The Integrative STEM Education graduate program at Virginia Tech
<http://www.soe.vt.edu/istemed/>
- STEM Education Center at University of Minnesota
<http://www.cehd.umn.edu/stem/>
- Journal of STEM Education
<http://jstem.org/>
- Intel Education <http://www.intel.com/about/corporateresponsibility/education/k12/stem.htm>

Related Trends



VET



Relevance-Oriented Learning



Learning to Code



Industrial Revolution 4.0



New Generation TV Sets



Wearable Technology



IV. Modern education is relevant

VOCATIONAL EDUCATION AND TRAINING

VOCATIONAL EDUCATION AND TRAINING

› Skills and competences wanted! ‹

Related Terms

Vocational schools, technical education, employability, occupationally-oriented education, vocational education and training, occupation, VET, lifelong learning

Perceived as opposite to general and academic education, vocational education and training have been treated contemptuously by societies. Such undervaluation is the reason for the fact that this field of education has for a long time been underfunded. Similarly, VET students have often been perceived as less capable than their academic peers.

Lately many modifications related to this field of education have taken place, all due to the changes on the labour market caused by the increasing importance of technology and the growing demand for highly-qualified specialists. The previous harmful and unfair image of this domain is consequently disappearing.

The balance between formal and informal education is sliding and vocational training is gaining more importance, by the same token VET is smoothly shifting into lifelong learning.

Nowadays VET is also faced with different challenges as the requirements the students have to meet differ greatly from the ones their parents and grandparents had to comply with. These differences are mainly the result of the fast development of technologies that are present in all aspects of our lives and professions. Modern specialists have to be permanently up-to-date with technological novelties related to their work.

Greater, instant access to information also has an important impact on knowledge – skills balance in favour of the latter. Digital natives don't need such a large amount of scientific

knowledge in their specialisation. What they do need is the ability to quickly find relevant information. This is why current specialists have new skills and competencies to acquire. The so-called 21st century skills, such as IT skills, problem-solving competencies or executive functioning skills are also becoming a must have for a highly-skilled vocational graduate.

On the other hand, in the dynamically changing labour market we also have to face two other phenomena: professional reorientation and mobility. This is why we shouldn't forget about soft skills such as adaptability.

As you can see, there are a lot of challenges awaiting the ongoing workforce. At the same time, the best can also expect much more than they could in the past. VET students and graduates are already gaining respect from other members of society. And the money is following – the best specialists can earn salaries similar to their academic peers.

Drivers

- Global economic crisis and unemployment
- Lack of qualified workers
- Growing number of "unemployable" graduates
- New professions and vacancies
- Many national and regional programmes to improve VET
- EU policies and big investments within ESF on VET as well as on lifelong learning
- Cooperation with local labour markets and partnerships with employers

Advantages

- Increasing demand for highly-qualified graduates
- Well-paid non-academic professionals
- Private sector contribution

Challenges

- Assuring a sufficient level of general knowledge and education
- Developed qualifications have to be relevant to labour market needs
- VET students have to develop both profession-related competencies and soft skills
- Good professional education needs investment

Examples

- NBC News
http://business.nbcnews.com/_news/2012/02/28/10498304-some-employers-want-return-of-vo-ed-training
- OECD review on VET
<http://www.oecd.org/edu/skills-beyond-school/41538706.pdf>
- RAND Education news on VET
<http://www.rand.org/topics/vocational-education.html>
- 7EU-VET project
<http://www.7eu-vet.org/>
- European Commission on VET
http://ec.europa.eu/education/lifelong-learning-policy/vet_en.htm
- "Who needs college? The Swiss Opt for Vocational School" at Time.com
<http://world.time.com/2012/10/04/who-needs-college-the-swiss-opt-for-vocational-school/>

Related Trends



Lifelong Learning



STEM



Relevance-Oriented Learning



Competence-Based Learning



IV. Modern education is relevant

LIFELONG LEARNING

LIFELONG LEARNING

> In pursuit of a better life <

Related Terms

Adult education, educational experience, experience-based education, home-based learning, self-study, autonomous learning, University of the Third Age, voluntary education, experiential learning, ongoing learning, knowledge work, PLE – personal learning environments, self-directed learning, brain fitness, e-learning, life-wide learning, community education, work-based learning, part-time adult learner

The process of constantly renewing, mastering and gaining general and professional qualifications between early childhood and old age is a new educational reality. This phenomenon may be referred to as voluntary education, with its own motivation, lasting a lifetime and touching every aspect of our lives.

Today's world is changing at an unprecedented pace and it's unlikely to slow down. The best way of dealing with unstable reality is to develop the ability to quickly adapt to new conditions. Lifelong learning is an essential part of this adaptation, particularly as it's impossible to provide people at the outset of their professional life with all the knowledge and skills that they will need throughout their lives. New tasks and new problems appearing in completely new environments will require constant learning.

In 2006, the European Union established a programme of actions concerning lifelong learning. The aim of the programme is to ensure continuous economic growth for the Member States by increasing the number of workplaces and eliminating social stratification. The development of different forms of lifelong learning is the promotion of an active society, capable of quick professional adaptation.

Common access to technology makes lifelong learning more accessible than ever before. Education doesn't have to be connected to a particular place or time and can happen anytime and anywhere.

Drivers

- Knowledge and skills must be constantly updated and extended for people to remain competitive in the job market, so adults should keep up with new trends and take part in educational programmes designed for them
- Changes occurring in the world today force people to constantly improve their qualifications, increasing the importance and relevance of ongoing education

Advantages

- Employment opportunities, keeping up-to-date, change of qualifications or professional development

In the professional domain:

- Avoiding professional obsolescence in the job market
- Increased income
- Better employment opportunities
- Opportunities to change profession
- Job security
- Successful career

In the personal development – change of interests and lifelong learning:

- Easy change of lifestyle
- Family values

- Better health and well-being
- Extensive life experiences

Challenges

- Has to be accessible for everybody irrespective of their origin, social background, age or material status
- Should take into account new skills and competences
- Its learning offerings should be flexible and assure adaptability with respect to initial knowledge and desired learning outcomes

Examples

- Massive Open Online Course (MOOC) is an online course available for free, designed by academic writers from all over the world and validated by educational institutions. Most courses are certified, some of the platforms available are: Coursera, Futurelearn, iversity, Veduca, Schoo
- The European Union strategy of growth – Europe 2020 – offering support for lifelong learning
- Free educational programs for mobile devices, available in the AppStore and Google Play

 *Related Trends*



VET



Learning to Code



Relevance-Oriented Learning



Competence-Based Learning



STEM



Informal Learning



IV. Modern education is relevant

INFORMAL LEARNING

INFORMAL LEARNING

› Education through practice ‹

Related Terms

MOOC, massive open online course, learning in the community, community learning, immersion learning, non-formal learning, formal learning, social learning, online learning community, work-based learning

Human beings are genetically programmed to learn and we learn constantly in many ways. This process occurs when we perform our daily tasks in both our work and leisure time, when we observe, listen, talk, read, make mistakes and simply cooperate with other people. Informal education may stem from an incentive to learn something, but more frequently it is involuntary and accidental. It is a natural part of our lives, the oldest form of education, and the basis of our early childhood development. It doesn't require any preparation or planning in advance. This is how most people gain skills and knowledge. Many people enjoy learning, but they dislike being educated. Education is forced, whereas learning is a matter of personal choice.

Some of the skills that we gain through informal education are:

- Skills learned at work such as project management and computer skills
- Language and intercultural communication skills, learned while travelling
- IT related knowledge gained outside of the workplace
- Qualifications acquired during contact with the arts and culture, doing sport, temporary work, household duties (e.g. childcare) or voluntary and charity work.

Informal education is based around conversation. Open dialogue promotes innovation, as people love to get together and talk in a lively atmosphere. This favours the exchange of knowledge, thoughts and ideas. Informal education is strengthened by the development of technology and the omnipresence of the Internet. Due to these factors, education has no borders, it can appear as a result of exchanging experience on an Internet

forum, in a chat room, through participation in a videoconference, or at a corporate event. It's the most natural way to learn and develop.

Drivers

- In today's world it's not sufficient to provide simplified information in a form that allows only one correct answer to a given question. The younger generation needs access to better methods of gaining knowledge. Methods that don't discourage independent thinking
- Globalisation means competing on a global level, shorter production cycles, and more matters to deal with and catch up with
- The more our civilisation develops, the faster time flows. Nowadays learning in advance is impractical, because we can never be sure whether things we learn will still be up to date and valid tomorrow

Advantages

- Adding technology to informal learning may lower costs and save time
- Informal learning, being more personal than formal or institution-based learning, becomes less stressful
- Experts and specialists share their knowledge more willingly and more freely in an informal situation, they are also more eager to participate in educational initiatives
- Learning in an informal way is natural, which is why learning during an ordi-

nary working day increases employees' receptiveness to new knowledge and reduces the resistance to its acquisition

- An informal approach to education, arousing curiosity and boosting self-confidence is beneficial for people with learning difficulties, and/or those who have had negative experiences connected with formal education. It offers them a better opportunity of finding a satisfying job
- Informal education unites people and whole communities, contributes to defying stereotypes and increases association among people from different backgrounds
- In the aging societies of the contemporary world, informal learning builds a bridge over the generation gap and enables people to stay active and independent at any age

Challenges

- People, whose knowledge is taken for granted may learn very little or nothing at all
- Informal learning depends on individual learning abilities – not everyone benefits from using this method

Examples

- Chat rooms and Internet communicators
- Internet forums
- Blogs
- Course management platforms
– Moodle
- Wiki
- Social network websites
– Flickr

Related Trends



Lifelong Learning



VET



21st Century Skills



Personalisation in Education



Learning to Learn



Individual Learning Style



IV. Modern education is relevant

RELEVANCE-ORIENTED LEARNING

RELEVANCE-ORIENTED LEARNING

› Why are we doing this? ‹

Related Terms

Relevance-oriented learning, problem-oriented learning, goal-oriented learning, experiential learning, head and hand, knowing and doing, abstract and applied, place-based education, community-based education, contextual learning, situated learning, connected learning

Understanding the goal of our actions is the most crucial factor affecting our motivation to perform them. The fairy tale example of Cinderella, who, as a punishment, was made to perform pointless activities, such as separating lentils from peas is not far from the school reality where students do endless mathematical calculations, read all chapters from textbooks, prepare posters and do all the other typical school tasks. They see these tasks as a punishment, pointless actions, since they don't understand how they could apply the knowledge in practice or in their social lives.

That's why it's so important to help students see the practical application of the knowledge and skills acquired at school. Discovering the connection between educational content, students' experiences and previously learned material has an enormous influence on their interest and motivation to learn and succeed in reaching their goal. A relevance-based method reinforces the natural learning process in which the acquisition of new information is only possible when it has a point of reference in the students' own experiences and knowledge and when they can trace the link between the new and the familiar.

While employing relevance-based methods, the role of a teacher is to facilitate finding those links and references so that any new content is firmly grounded in a wider context, embracing the reference system with which students are familiar. This can be achieved by teaching in an environment possibly related to a given topic: in the forest, museum, planetarium etc. In a relevant environment, new information is absorbed more quickly, since students discover it themselves, which enhances the memorising process and establishes associations more easily.

Drivers

- Difficulty understanding academic notions by students (e.g. mathematical)
- Poor learning results, reflected by scores of standardised tests
- Lack of common communicative ground between students and teachers who use different language and don't share a common vocabulary base
- Difficulty reaching students of different backgrounds, talents and predispositions
- Difficulty keeping class discipline where most students are uninterested in the subject matter being taught
- Lack of access to a solution for incorporating individual lessons as parts of a whole, wider system of gaining knowledge

Advantages

- Improvement in students' achievements, including results of standard tests
- Better school discipline
- Learning to assimilate and connect the contents of different courses
- Learning of critical thinking and a higher level of cognitive thinking skills.
- Preparing students for life in the future, especially in professional and social aspects

Challenges

- It's not a universal method – can't be used for subjects that require more abstract thinking

Examples

- Connected Learning Alliance
<http://clalliance.org/make-learning-relevant/>
- Edutopia's Schools That Work
<http://www.edutopia.org/schools-that-work>
- Ariel Community Academy
<https://www.arielinvestments.com/content/view/107/1067/>
- Literacy in Learning Exchange
<http://www.literacyinlearningexchange.org/vignette/making-learning-relevant-bringing-world-classroom>
- The Hydrology Project: Making Learning Relevant
http://bie.org/object/video/the_hydrology_project_making_learning_relevant
- Mathalicious – real-world lessons
<http://www.mathalicious.com/>
- Math portal – e-zadania.pl
<http://www.e-zadania.pl/>

 *Related Trends*



STEM



VET



21st Century Skills



Personalisation in Education



Interdisciplinary Education



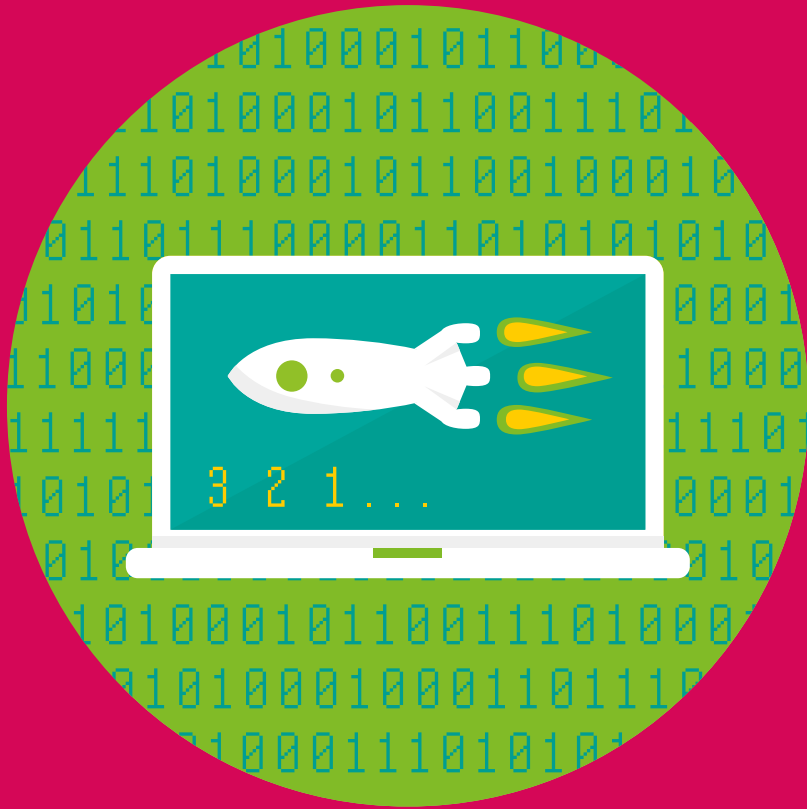
Problem Based Learning



Maker Culture



Industrial Revolution 4.0



IV. Modern education is relevant

LEARNING TO CODE

LEARNING TO CODE

› Modern education is about reading, writing, arithmetics and...algorithm! ‹

Related Terms

Coding, programming, computing, ICT, IT, computer science

Computers are everywhere. They are a part of everybody's life – whether you're working on the surgical ward or talking to a friend overseas. Everything goes through computers. This is why coding is one of the most wanted skills on the current labour market. This skill, intrinsic to software developers, is in full expansion. Training in coding is beginning to be offered not only to IT professionals. Examples are coming from the top: NYC Mayor – Mike Bloomberg affirms learning to code, famous actor – Ashton Kutcher fights for the introduction of computing into the public school system, Bill Gates praises coding claiming it stretches our minds.

Nowadays, computer training is not only offered by higher education courses and specialised training centres but more and more often by open web services and open classes – boot camps, where everybody can learn the coding basics free of charge. At school computer science is nothing new, but the current trend is to introduce it during the very first stages of formal education. The official curricula in countries like Finland, Estonia, and recently also the UK, contain obligatory coding courses already in primary schools.

Learning to code at school is generally organised around three areas: computer science, information technology and digital literacy. But the primary objectives of such education are neither to write the code, nor to learn how computers work. The very first aim is to solve problems. To deal with a problem, students are taught to define and tackle it, break it down into smaller, solvable chunks in order to devise the algorithms that will solve it. From this perspective, we are not talking about simple science learning, but about contemplating thinking and logic reasoning. And how to apply this computational thinking? The most common process consists of decomposition, pattern recognition, abstraction, pattern generalisation and algorithm design. At the same time such use of ICT technology encourages critical thinking and creativity, develops the skills of both analysis and synthesis and, by the same token, engages both cerebral hemispheres.

From this perspective, learning to code has no disadvantages. It accustoms students to complex thinking, 21st century skills development and helps them deal with problems. The ability to design algorithms seems to be so important that some have proclaimed it as the fourth basic competence next to writing, reading and arithmetic.

Having said all that, we have to keep a clear line between the digital and real world ensuring that our students keep a healthy balance between both of them. At the same time, we should be mindful of the above-stipulated overall competences while educators should help students apply them in their everyday lives.

Drivers

- Technology and digitalisation development
- Increasing demand for programming skills
- Increasing presence of information technology
- Rising demand for software developers

Challenges

- Maintain the balance between the digital and real world
- Assure the development of general competences not only code design
- Provide schools with hardware and network infrastructure.

Advantages

- Develops critical thinking
- Encourages creativity
- Develops logical thinking, exercises the brain, engages both cerebral hemispheres
- Contributes to problem-solving skills
- Develops technical skills, required on the labour market.

Examples

- Code.org <http://code.org>
- Scratch <http://scratch.mit.edu/>
- Codecademy <http://www.codecademy.com/>
- Hack Education Blog <http://hackeducation.com/2013/12/04/top-ed-tech-trends-2013-coding-programming-making/>
- Digital Media and Learning – article <http://dmlcentral.net/blog/ben-williamson/programming-power-does-learn-ing-code-empower-kids>

 *Related Trends*



Open Source Learning



Problem-Based Learning



STEM



Competence-Based Learning



Relevance-Oriented Learning



VET



IV. Modern education is relevant

COMPETENCE-BASED LEARNING

COMPETENCE-BASED LEARNING

› Relevant education is not only about knowledge, it's about its application! ‹

Related Terms

Competence-based training, outcome-based learning, proficiency-based learning, mastery-based learning, performance-based learning, work-based learning, vocational education, skills and competences, abilities, mastery learning

Competence-based learning was introduced as an official method into VET by the end of the 1980s in Australia. Since then it has gained recognition in other countries not only in secondary vocational education and vocational training – now it's often also adopted in higher education. With the arrival of new technologies in education, we can also observe a growing amount of online competence-based learning providers.

But what exactly is competence-based learning and why is it so popular? Contrary to traditional methods, it is an approach that focuses not only on students' knowledge, but on the ability to use this knowledge in practice (competence).

This is why you can also read about mastery-, outcome-, proficiency- or performance-based learning.

In competence-based learning, students acquire new knowledge, develop new skills and work on their attitudes in order to develop the required competence. At the end, they have to prove they've mastered it and only then can they proceed to another competence. This model ignores the time factor, which means that students work at their own pace. This also means that they can skip some learning activities if they prove proficiency of a required skill or spend more time on more challenging competencies.

The teacher's role is also different from the traditional teacher-centred methods. As in all approaches in which the focus is on the student and the outcomes, the teacher is not the only knowledge provider in competence-based method either. The teacher's role

is to guide the students, facilitate learning and help them develop required competencies. And since students work at their own pace, teachers have to adopt a personalised approach.

There are also no special restrictions in relation to the learning environment. Of course, competence-based learning can take place in a class with the teacher as a guide, who helps each student individually. However, as there is no need for the group to progress together, the class structure doesn't have to be fixed or standardised. This approach also offers tremendous flexibility, which, with the arrival of new technologies, provides many opportunities for the blended learning model. This is why a lot of vocational training centres, as well as universities, often use this model in their online competence-based courses.

The online competence-based courses are becoming very popular nowadays. There are plenty of reasons for that; one of them being new technologies, which offer new distribution channels for learning offerings. Similarly, as the competence-based approach is suitable for online and/or blended learning models, it gives a learning opportunity to people who cannot benefit from regular courses because of their professional activity or family commitments. It is a very strong argument, especially that they can develop new competencies at their own pace.

Since online competence-based learning offerings have been on the market for quite some time now, we already have the first empiric research results. It seems that this approach accelerates degree completion and, by the same measure, reduces costs. These kinds of courses also have great potential in the corporate sector where targeted and customised programs can precisely meet the needs of employers.

Drivers

- Growing importance of student-centred approaches, autonomy and personalisation
- Adoption by higher education (medical and technical professions) with respect to the real needs of the industry
- Only real work/life skills required by the labour market are objects of the education process
- Growing educational offerings in life-long learning sector with increasing importance of online and/or blended learning model
- Student self-paced approach as an opportunity for the professionally active population to develop their competences

Advantages

- Growing importance in vocational training for the industry and corporate sectors
- More compatible with blended and on-line learning models
- Lifelong learning especially for the professionally active

Challenges

- Detailed competences description with respect to upcoming work or further learning requirements
- Advanced assessment to verify the mastery of each competence
- Relevance of assessment in the online learning model

Examples

- Wikipedia http://en.wikipedia.org/wiki/Competency-based_learning
- The Glossary of Education Reform <http://edglossary.org/competency-based-learning/>
- Harvard Business Review <https://hbr.org/2014/10/the-real-revolution-in-online-education-isnt-moocs/>
- Council for Adult and Experiential Learning <http://www.cael.org/what-we-do/competency-based-education>

- SkilledUp insights <http://www.skilledup.com/insights/competency-based-education-is-not-new/>
- Getting Smart community – infographic <http://gettingsmart.com/2014/04/competency-based-teacher-preparation-infographic/>
- Teach Thought <http://www.teachthought.com/learning/what-is-competency-based-learning/>
- Energy Skills Australia project <http://energiseoz.com.au/index.php/background/competency-based-training>

Related Trends



Personalisation in Education



Student-Centred Learning



Relevance-Oriented Learning



Real-Life Skills



VET



IV. Modern education is relevant

SCENARIO-BASED LEARNING (SBL)

SCENARIO-BASED LEARNING (SBL)

› Immersion in real life situations ‹

Related Terms

Case-based learning, problem-based learning, scenario-based e-learning, learning environments, whole task learning, goal-based learning, activity-centred learning, simulations, active learning, simulation-based e-learning, computer-based simulations, experience-oriented learning, immersive learning, articulate storyline, situational learning

SBL is a form of e-learning that uses interactive scenarios to support students' proactive learning approach. The scenarios are built on complex, real-life problems and situations and appeal to students' experience, which requires using practical knowledge and skills development. SBL is especially appreciated in vocational training.

The scenario includes a sequence of elaborated real-life problems with alternative solutions to be chosen/decisions to be made. What differentiates SBL from other e-learning forms (e.g. drill and practice, tutorials) is that in order to progress within the course, learners have to make decisions instead of just giving answers to questions. As a result, it improves performance and involvement.

SBL puts learners in a real-life situation, described in the scenario. Learners have to use the practical knowledge they've already gained, apply critical thinking and problem-solving skills, make decisions and try to solve a complex problem with the best possible outcomes. There are no right or wrong answers, only success and failure paths. SBL creates a dual reality in which learners are immersed in a real-life situation. SBL is effective since it allows the student to learn by doing, and also by failing, often quickly, but also safely.

SBL scenarios are often non-linear and provide rich feedback, according to the decision made by the student at different stages of a scenario. Real life is a never-ending learning situation. SBL is trying to get as close to that as possible.

Drivers

- Need to find ways of gaining experience in life other than the day-to-day ones
- Need to develop problem-solving, critical thinking and decision-making skills

Advantages

- Engages emotions that help to recollect special long-term memory creating linkages
- Gives a chance to correct mistakes, just as in real-life situations
- Promotes critical thinking
- Shortens the time needed to gain experience in everyday life
- Provides context
- Provides students with authentic learning experience
- Speeds up the learning experience

Challenges

- Building more complex SBL scenarios is time-consuming
- Building realistic scenarios is difficult

Examples

- e-learning software
<http://www.sblinteractive.org/>
- Adobe Captivate
<http://www.adobe.com/products/captivate>
- Udutu <http://www.udutu.com>
- Stochasmos <http://www.stochasmos.org>
- Emergo <http://emergo.ou.nl/emergo/community/EN/overemergo.htm>
- ChemCollective (Online Resources for Teaching and Learning Chemistry) – examples of scenario-based activities
http://chemcollective.org/scenario_based
- “Scenario-Based Learning: Using Stories To Engage e-Learners” a paper by Ph.D. Ray Jimenez
<http://www.amazon.com/Scenario-Based-Learning-Stories-Engage-Learners/dp/0979184746>
- Vignettes Learning
<http://www.vignetestraining.com/>

 *Related Trends*



Problem-Based Learning



Storytelling with Technology



Edu-LARP and Drama



Adaptive Learning



21st Century Skills



IV. Modern education is relevant

REAL-LIFE SKILLS

REAL-LIFE SKILLS

> Skills you need to succeed <

Related Terms

21st century skills, real-world skills, life skills, transferable skills, employability skills, soft skills, life skills, people skills, life skills-based education (LSBE)

Real-life skills are a set of human skills acquired through the education process and/or personal experience, related to dealing with problems and questions everyone needs to face in their adult life.

The scope of real-life skills differs in accordance to social standards and expectations but together with the globalisation process there emerges a set of universal, so called transferable skills. These are generic skills allowing us to cooperate effectively, make conscious decisions, solve problems and be a valuable member of every organisation. Even though these skills build a foundation for a future career, today's schools fail in raising them, which means employers have to invest time and money to train their employees. Schools all over the world need to provide career-related experiences or competences to allow students to develop real-world skills essential in their future work. In particular, those are:

Problem-Solving

It's a combination of critical thinking, organisation and creativity. Although teachers are trying to teach these skills, the problems discussed in schools differ a lot from real-life problems. For this reason, the issues related to work environment, such as scheduling, allocation of duties, budgeting, etc. should be elaborated in schools.

IT Skills

Most students can quickly deal with the Internet and such devices as computers, tablets and smartphones. Still, those are not the only skills needed in the modern office environment. The ability to analyse spreadsheets with loads of data, the ability to prepare slideshows that are not only attractive but first of all informative, setting up a conference

call, dealing with minor office equipment problems are only some of the essentials skills. Students should also know how to set up company hardware, including extension phones and audio-visual equipment.

Executive Functioning Skills

These are the ability to focus, remember, meet expectations, and self-control. All of the above have a huge influence on how work is performed. Students should learn how to finish every task, implement knowledge in the current situation, take up new challenges and always be professional.

Communication

In the work environment not only the ability to give presentations and formulate written statements is essential. Equally important is the ability to negotiate with both co-workers and the superior, to define client's expectations and write a persuasive and compelling CV or cover letter.

Drivers

- Need to teach children more than just facts
- Need to make relations between school education and real-life challenges
- Need to prepare students for the challenges of the 21st century
- Need to prepare students for work environment challenges and competing in a global economy

Advantages

- Increase the life quality for everyone – equal opportunities
- Better performance at university
- Better attitudes and behaviours: motivation to learn, commitment, time spent

on learning and better behaviour in the classroom

- Fewer problems with students' depression, stress, anxiety, social withdrawal

Challenges

- Difficulties in assessing students' progress
- Creating a real-life environment in school can be costly and not as real as it should be
- Teachers should possess those very skills themselves which may not be that obvious

Examples

- 21 apps That Teach Kids Real-Life Skills
<https://www.common sense media.org/blog/21-apps-that-teach-kids-real-life-skills>
- Life Skills Winner
<http://www.lifeskillswinner.com/#demo>
- Macmillan Life Skills
<http://www.macmillanenglish.com/life-skills/>

Related Trends



Relevance-Oriented Learning



Problem-Based Learning



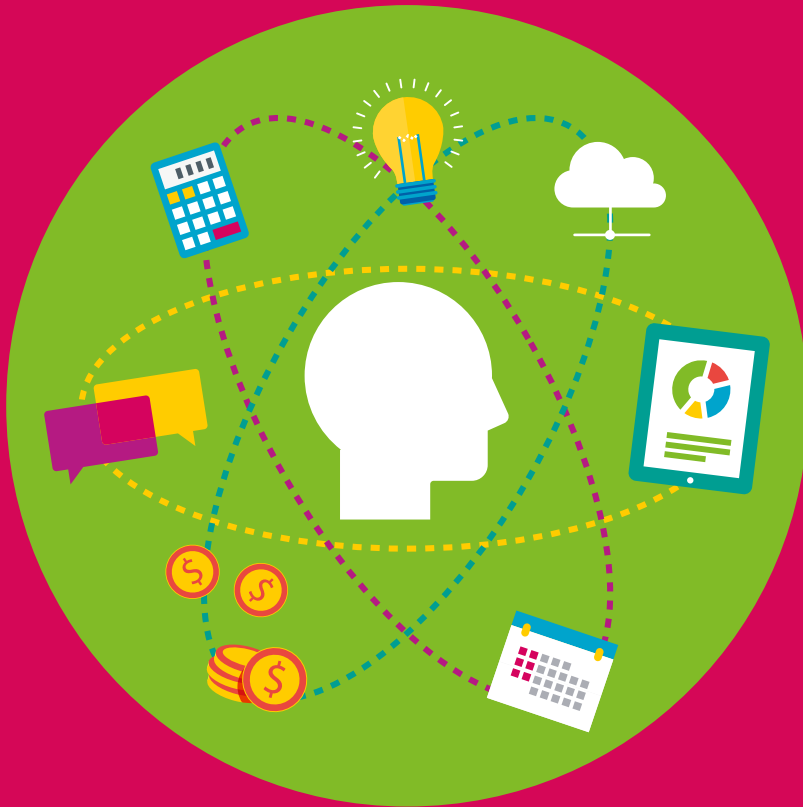
Competence-Based Learning



Lifelong Learning



VET



IV. Modern education is relevant

21ST CENTURY SKILLS

21ST CENTURY SKILLS

› Redesigning Education ‹

Related Terms

21st century lifelong skills, 21st century learning, 21st century education

On 1 January 2001 humanity entered a new age, often called the information age. With the dawn of the new century appeared the necessity to develop skills needed to survive in a new world. The skills that used to be necessary, such as being professional, effective, getting along with others and working hard are often no longer sufficient in our information-based economy. To obtain and maintain information-age jobs we need to change our approach to teaching, learning and education as a whole. Defining the skills required in the modern world and the job market is one of the attempts at redesigning the education.

The 21st century skills include the core subjects such as reading, writing, science and mathematics, but also emphasize global awareness, economic literacy, and health issues. The skills could be divided into three categories:

- learning and innovations skills: critical thinking and creative problem solving, collaboration and communication, innovation and creativity;
- literacy skills in the digital era: information literacy, ICT literacy and media literacy;
- life and career skills: adaptability and flexibility, initiative and a self-driven attitude, leadership and responsibility skills.

The definition of a few specific skills which then would be taught and tested is definitely not all when it comes to 21st century education. First of all, it seems that the new education will be evidently learner-driven with learning taking place in a global class, not limited to four walls, with a large share of technology.

Drivers

- Rapid changes in today's world and especially in industry require students to be flexible, and able to follow the changes
- Demand for employees who can think critically, creatively solve problems, collaborate, are innovative and able to effectively communicate in multiple media
- Necessity to switch from learning abstract and non-material things to learning skills that will be useful for living in the information age

Advantages

- Learning skills, especially those useful in everyday life, instead of tedious acquisition of knowledge helps to re-engage pupils in education
- Incorporating the 21st century skills in the standard school procedure makes it possible to create an educated workforce with a culture of lifelong learning, ready and prepared for rapid economic changes.
- This approach fills the gap in skills, especially in numeracy and the use of IT; intermediate skills at apprenticeship and management

Challenges

- Risk that the 21st century skills are another initiative to improve learning efficiency that will be dead and won't

find acceptance among students and teachers

- Skills and knowledge are inseparable and should be taught equally and simultaneously. It's important to know that people need knowledge and information for abstract thinking and that prioritizing skills over knowledge makes no sense

Examples

- A short list of the skills of the 21st century with explanations
http://www.ims.gov/about/21st_century_skills_list.aspx
- A short animation that shows what 21st century skills are
<https://www.youtube.com/watch?v=qwJL-hZcAd0I>
- A document prepared and presented by the Secretary of State for Education and Skills by Command of Her Majesty
<https://www.gov.uk/government/publications/21st-century-skills-realising-our-potential-individuals-employers-nation>
- 21st century skills implementation guide
http://www.p21.org/storage/documents/p21-stateimp_assessment.pdf
- Short presentation about best practices in teaching in the 21st century
<http://www.eiu.edu/facdev/PowerPoint%20-%203%20Ames.pdf>

 *Related Trends*



Relevance-Oriented Learning



Problem-Based Learning



STEM



Real-Life Skills



Anna Miler

TIPS & TRICKS

TIPS & TRICKS

- When planning activities, take into consideration the competences of the participants, and make sure everyone learns something new
- Think about the participants' various needs associated with their age, disabilities, life-style, learning style, cultural differences etc.
- Examine the context and make sure that the action you plan at a given place and time is needed and expected
- Remember about gender balance, e.g. when you organise technology training, make sure that there are women among the instructors and both women and men participate in the educational process
- Use gender-sensitive language – avoid following stereotypes and inviting women for workshops on care work or communication and men for technology trainings
- Consider the formation of two groups in the case of high-tech skills training – one for men and one for women
- Use the tools available online – make sure that your materials don't disappear when your licence expires or if you stop paying for your server. Make them available to the blind (audio description) and the deaf (transcription)
- Ask the participants about their expectations. Use this information to form training programmes
- Use the available resources – human and place resources etc.
- Use the participants' interests and provide them with the opportunity to present their knowledge and put it into practice
- Specify and inform the participants about the objectives of the educational activities and the possibility to employ them in everyday life
- Use integration and motivation methods
- Offer various activities to make sure there is always something interesting for everybody



II. Modern education is fun

CASE STUDY

Alina Idzikowska

Learn programming to be able to teach your students

Challenge:

I'm a music and history teacher. The last time I had contact with mathematics was in secondary school. At the same time, I'm interested in developing my students' mathematical skills so I was happy to learn programming using the Scratch language under the "Coding Masters" (original name: "Mistrzowie Kodowania") pilot programme. Each teacher involved in the project had to conduct eight two-hour lessons for children from 4th to 6th grade.

Process:

The training took four days. We were introduced to the basics of programming and Scratch, a free programming language created specially for children. We were also provided with materials necessary to conduct the classes and communicate in case of problems or doubts. Two more teachers from my school took part in the project so we could share our experience and help each other. Each of us had a group to teach during the extra-curricular classes. My group had 8 members. The classes were a challenge. There will always be a moment when a student will say: "why is it not working?" and you have to identify the error. I was afraid that I wouldn't be able to answer my students' questions. But in the course of the classes it turned out that we were all having fun. We explained all doubts together. I can't say I am an expert in Scratch, but I am sure that two of my students already know more and they seriously took up programming.

Effects:

We informed other students, teachers and parents about the project. The students worked on different levels with varied frequency. Everyone found something interesting about the programme – some preferred playing with graphics and sound while others loved presentations and games. Two of my students became seriously interested in programming and became experts during the following edition of the project. We demonstrated our skills during school events. We participated in the Coding Masters Gala which took place at the end of the pilot edition of the project. I also entered the first project edition. One of my students presented her skills during various school classes to make the project more popular among her classmates.

Anna Miler

Using new media in work with adults

Challenge:

The project called “The shipyard is a woman. The stories of women who worked at the Gdańsk Shipyard” (original name: “Stocznia jest kobietą. Opowieści kobiet ze Stoczni Gdańskiej”) was inspired by the lack of materials concerning everyday life at the shipyard and the desire to use new media to record and popularise unwritten stories. It meant that the adults who participated in the project had to develop high technology competence as well as social and interpersonal skills. There are a lot of people interested in the humanities who think that high technology is not their cup of tea, but I think they should be shown that it’s for everyone. Thanks to the application of high technology during work with a community, work associated with identity and the development of soft skills, the majority of participants involved in the project were women. This is crucial in the context of increasing women’s share in high technology development.

Process:

The project has been divided into a few stages:

- Preparation, including the choice of adequate equipment, deliberating on the motives behind the use of a given technology
- Workshops aimed at explaining the unwritten story method, the story of the women and the technical aspect of recording; interviewing and processing the digital record – learning through experience
- Preparing a script about the work at the Gdańsk shipyard for the audio guide and audio plays
- Preparing the audio guide and audio plays on the basis of the records
- Evaluation and determination of the direction in which the project should go

During the workshop, we talked through each project stage. We discussed how to establish the relations between the interviewers and interviewees as well as how to prepare

and conduct the interview itself. We dedicated a lot of time to the technical issues of sound recording and acoustics. The project participants divided the tasks among themselves: some recorded the interviews, others were responsible for the promotion and making contacts with potential interviewees, a separate group listened to the interviews and prepared the script. The latter was quite a challenge as preparing a final narration involved a lot of editing and experimenting with various solutions. Digital tools open up a number of possibilities in this area. The project was being evaluated on an ongoing basis which enabled continuous modification of performed operations. Additionally, we held supervision meetings during which we were able to solve problems that had come up.

In the first stage of the project we decided to create a digital social archive that would present the growing amount of materials associated with the work at the shipyard. As a result, the project participants began to expand their knowledge of digital archiving, social archives and the digitalisation process.

Effects:

The project outcome is a free audio guide about the work of women at the Gdańsk shipyard which is available for download at: <http://art-eria.pl/publikacje.html>, as well as material about the project good practices: <http://metropolitanka.ikm.gda.pl/dzialania/sjk/dobre-praktyki-sjk/>. Additionally, two audio plays are intended for publication in December 2014. They concern both technical and technological matters and provide advice on how to prepare an interview and establish a relation with the interviewees. They also contain information on free tools that might be useful in teamwork and coordinating the work of others. All materials produced in the course of the project are available with Creative Commons Attribution – Share Alike 3.0 Poland license or Creative Commons Attribution – No Derivative Works 3.0 Poland, which allows for their widespread use.

The project team is constantly learning. The next stage will include seniors who will be acquiring new competences and participate in workshops aimed at the development of their digital competences – some will come into contact with high technology for the first time. Their role will not be limited to consultation regarding the products. They will take an active part in creating audio plays and apps for mobile devices. The seniors will be able to make suggestions as to the skills and subjects they would like to deal with during the workshops. More importantly, the pretext for acquiring new competences is a subject close to the heart of many seniors who are professionally or personally connected with the Gdańsk shipyard, which makes them even more involved in the project.

The Needle Felt the Thread, i.e. an inter-school avatar campaign

Challenge:

Education should not focus solely on spreading theoretical knowledge, but should teach skills which may prove to be useful in real life and develop social competences. The starting point for the project is the Class DoJo platform used by many teachers in early childhood education.

Process:

As a part of the technical education classes for the students of the second and third grade at the middle school, I conduct handicraft classes during which we make various objects entirely by hand. The “Needle Felt the Thread” project (original name: “Filcowata Igła z Nitką”) involves sewing mini avatars for the first, second and third grade students from a selected elementary school in Poland. The avatars are personalised, cute coloured monsters the students select on the Class DoJo platform. Then, the middle school students choose one person for whom they will sew an avatar on the basis of the little monsters’ pictures. The classes take place every other week and last two hours. The students complete the consecutive stages of the sewing process: they make a paper pattern, select appropriate colours of felt and threads, use the pattern as a guide in cutting the fabric, sew on small objects (eyes, teeth, mouth, eyebrows, special additions), sew the avatar using decorative stitches and fill it with silicone filling material. Each process stage is documented and published on HAND-MADE blog (www.handmade-pielgrzymowice.blogspot.com).

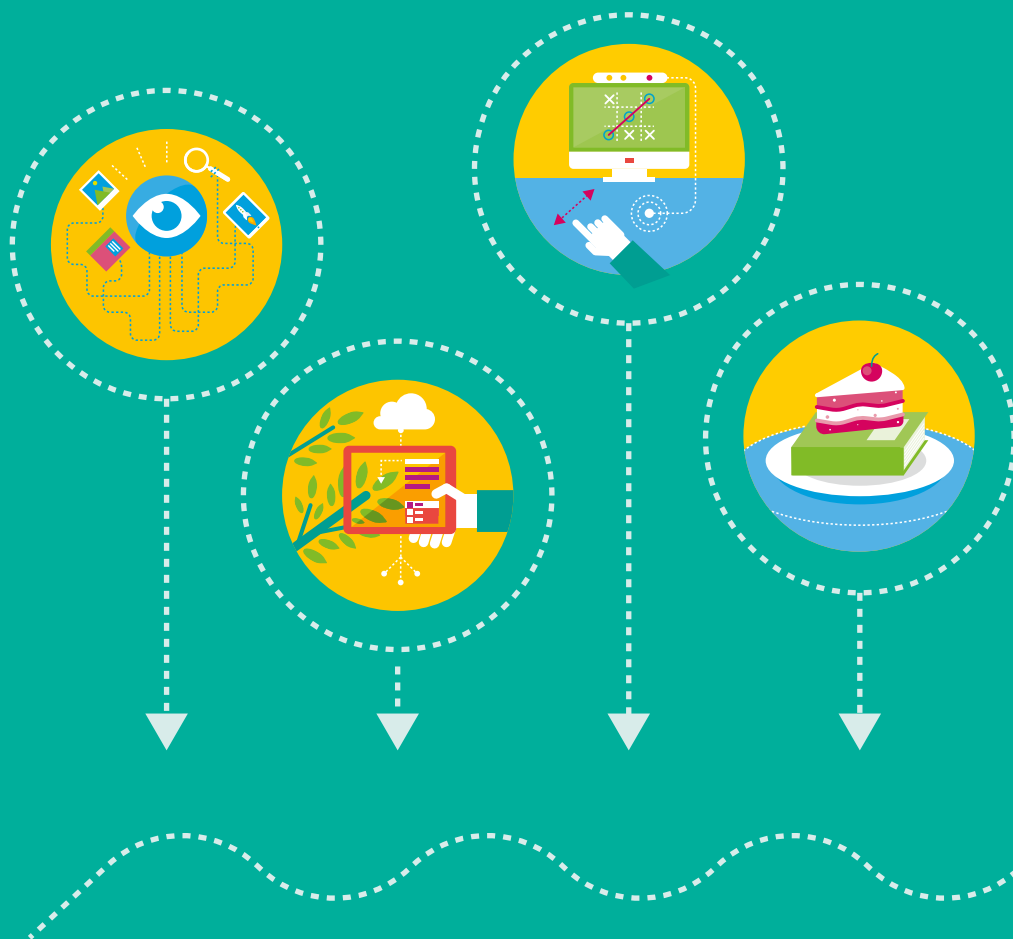
Effects:

Finally, the new avatars are mailed to the selected school. The students also send a short video in which they present themselves and say hello to the child for whom they’ve made the toy. In exchange, the young pupils often prepare a surprise for the older students – handmade postcards or small gifts and a thank-you video. There’s no better way to teach students empathy, sensitivity and selflessness. The avatar campaign gives the students an opportunity to experience what it’s like to give something and expect nothing in return and at the same time experience great joy. The project is a rich source of positive energy.

So far, we have completed two avatar campaigns:

- The first in cooperation with Ms. Moniak Walkowiak and the first graders at the elementary school in Kamieniec Wrocławski
[http://handmade-pielgrzymowice.blogspot.com/search/label/Kamieniec Wrocławski](http://handmade-pielgrzymowice.blogspot.com/search/label/Kamieniec+Wroclawski)
- The second in cooperation with Ms. Jolanta Okuniewska and the third graders at the elementary school in Olsztyn
<http://handmade-pielgrzymowice.blogspot.com/search/label/Olsztyn>

In the meantime, we are making additional felt monsters that are sold during school fairs organised by the students.



Monika Mizerska, Wojciech Wiśniowski

MODERN EDUCATION IS MULTIMODAL

MODERN EDUCATION IS MULTIMODAL

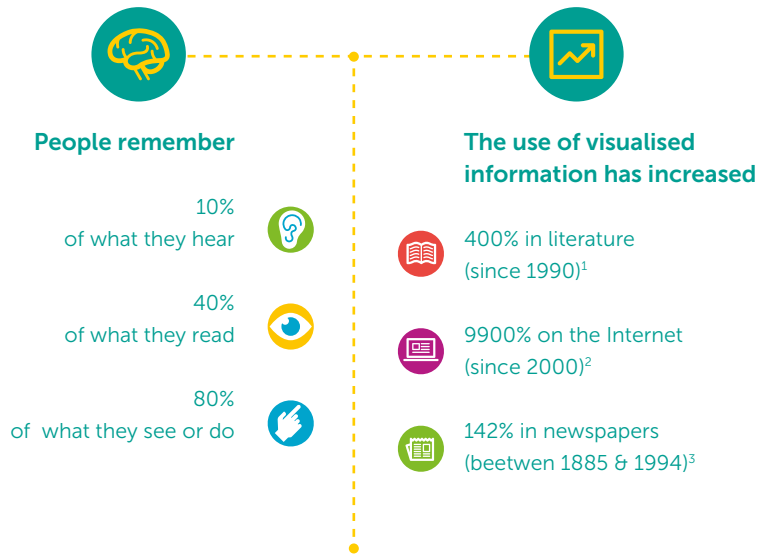
The way we communicate has changed dramatically and those changes intensify with the increase in the accessibility and mobility of digital technology. Today we are able to communicate instantly with combinations of texts, photographs, videos etc. via tablets and smartphones, computers and multimedia devices. We're able to participate in wikis and blogs, tweet and post on other networking sites such as Facebook or YouTube. We can obtain instant information from the Web and participate in virtual reality through gaming. All of the above creates a new environment, changing the way people present themselves, make relationships and communicate.

And the truth is that the nature of communication is multimodal: people use language, gesture, posture and other non-verbal modes such as visuals to communicate, all at the same time. To conduct research we often use multiple media. We find creative ways like mind maps to write down what we perceive and/or understand. We naturally explain the world to others in a multimodal way: children construct multimodal messages from the very beginning as they see the world as a multimodal text it really is.

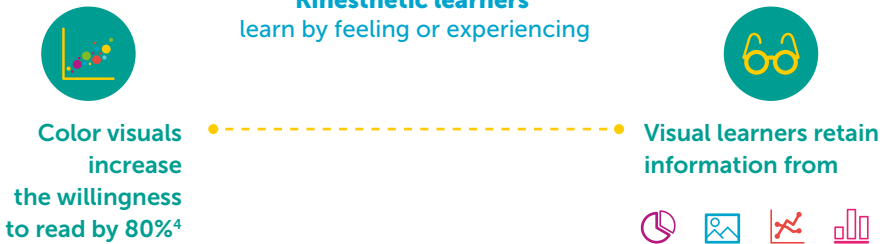
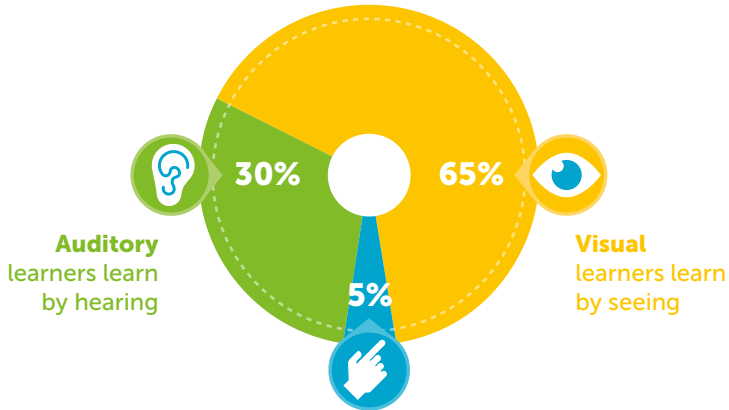
Multimodality is the integration of a set of modes like sound, colour, text, image etc. as resources for creating more complex messages, with richer meanings than what could be accomplished using one mode. Modes, such as images, words or sounds often occur simultaneously where one mode dominates. For example the sound mode dominates in podcasts whereas the visual mode dominates when processing screen-based text.

Since multimodality makes messages easier to understand, it improves the learning process. This happens because the use of different resources improves comprehension: an image shows immediately what would take time to read, written text helps to explain things difficult to represent through images, colour highlights important parts.

At the same time the use of multimodality in text creation allows people to assimilate concepts by using and integrating different mental skills, thus building knowledge by themselves. It helps people to get a broader look at the world and to achieve more. It's especially helpful for information-age students who have to deal with data overload.



Types of learners



1 Google Ngram Viewer
 2 Google Trends
 3 Zacks, J., Levy, E., Tversky, B., Schinao, D. (2002). Graphs in Print, Diagrammatic Representation and Reasoning, London: Springer-Verlag.
 4 Green, R. (1989). The Persuasive Properties of Color, Marketing Communications.

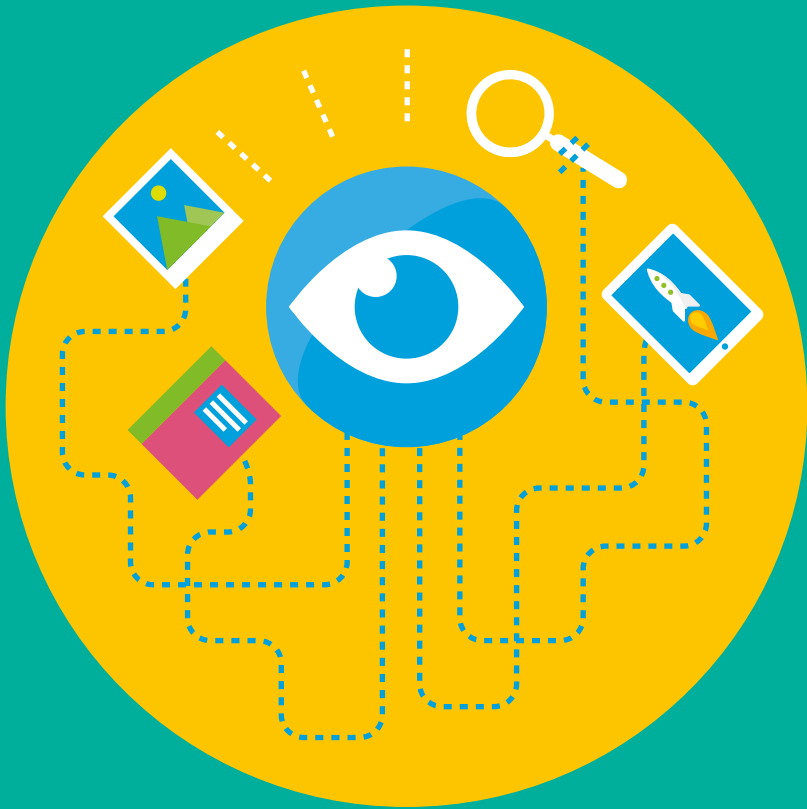
V

Modern education is multimodal

1. Visual Literacy
2. Augmented Reality
3. Gesture-Based Learning
4. Snack Learning

Teaching tips & tricks to make teaching and learning multimodal

1. Case Study: Creation and online distribution of multimedia resources in teams
2. Case Study: In the land of Grimms' fairy tales – German language from a new perspective
3. Case Study: Creating an educational video blog called "Polish language manual"



V. Modern education is multimodal

VISUAL LITERACY

VISUAL LITERACY

› Learning to see better ‹

Related Terms

Visual literacy , visual thinking, visually oriented education, visual education, visually oriented curriculum, visual media, visual texts, thinking in pictures, picture language, visual search, intermediality, knowledge visualization, media literacy, visual communication, visual knowledge, multimodality, multimodal literacy

Visual literacy, in short, is the competence to create and consume visual messages. It's the ability to "read" meaning from everything we see. It extends the primary meaning of the term "literacy" with a belief that an image can be "read" and communicate the meaning. Visual literacy is also the ability to evaluate, use in practice and create a concept's visual representations. It's the key to sensory literacy, the basic aspect of critical thinking. And it has to be taught. Students have to learn how to use their senses in the most efficient way.

Learning visual literacy lies beyond the school classroom and is needed in every aspect of our lives, including our careers: doctors, nurses, reporters, policemen, plumbers, bus drivers, chefs and many more use visual literacy in their daily, professional life. As much as visual literacy is a fundamental ability of human beings (70% of sensory receptors are located in the eyes), it takes on a special meaning in the era of technological buzz.

Let's take textbooks for example – they're full of visuals, but the visuals seem to be only add-ons for the written text. It should be the other way round: visuals should be the primary content, supported with accompanying text.

Human beings are designed for visual perception: 70% of our sensors are located in the eyes and almost 50% of the brain is engaged in visual processing. So why do we talk so much in the education process? We have to start using more visuals in education, aiming at a visually-oriented education system and developing visual literacy among students.

In teaching Maths, for example, we get rid of visual representations very early, rushing in the algorithm and written methods. We forget that a picture is worth a thousand words and strategies such as model drawing help to make mathematical problems that look complicated easier to understand.

Teachers complain a lot that students don't follow instructions or/and that they don't remember anything from what they're told. Preparing and presenting a visual alternative for an instruction or a speech does take more time, but repeating a lesson or instruction takes even more.

Today's students are very knowledgeable about media since they grow up with TV shows, video games, computer images, movies and advertisements. And if we want to teach them, we first need to reach them, introducing visual media into our schools and using the same language that they do.

Drivers

- It's becoming a critical skill in the globalized, digital world
- The school environment must adapt to a student's life and learning styles
- Supports the process of getting to be a proficient and mature reader who enjoys reading by developing visual imagery, learning vocabulary and concepts
- Helps to learn how to create visual media

Advantages

- Helps to interpret visual media and art and perceive meaning that hasn't been seen before
- Supports the process of analytical thinking about meanings and representations of particular relevance in text messaging
- Supports creativity and analysis at the same time, as well as writing and visual production

Challenges

- Helps to be a more aware and skeptical consumer of all visual media, e.g. commercials
- Teachers may not be able to teach visual literacy effectively if they're not visually-literate themselves
- Visual representation of a concept may be more convincing than it really is – manipulation's possible
- Visual education efficacy highly depends on a student's past experience

- Visualization may distract a person from the main goal
- Delivering visuals is costly to produce in terms of money, time, equipment and know-how

Examples

- Australian Curriculum for Visual Knowledge <http://www.australiancurriculum.edu.au/generalcapabilities/literacy/organising-elements/visual-knowledge>
- Lino <http://en.linoit.com/>
- Pinterest <http://www.pinterest.com/>
- Pic Stitch <https://itunes.apple.com/us/app/pic-stitch/id454768104?mt=8>
- Symphonical <https://symphonical.com/>
- My Roll <http://www.myroll.com/>
- Kanvas <https://itunes.apple.com/gb/app/kanvas/id653298682?mt=8>
- Over <http://madewithover.com/>
- Write About This <http://www.writeaboutapp.com/>

Related Trends



Storytelling with Technology



Relevance-Oriented Learning



Augmented Reality



Learning to Code



Flipped Classroom



Personalisation in Education



V. Modern education is multimodal

AUGMENTED REALITY

AUGMENTED REALITY

› Augmentation of human perception ‹

Related Terms

Internet of things, authentic learning, computer-generated sensory input, mediated reality, mixed reality

Augmented reality (AR) is the enhancement of reality "seen" by the user through a device that presents additional information. The device has to have a "see-through display" or a camera – it can be either a laptop, a tablet or a smartphone. Additional information can be imposed on real images in the form of graphics, sounds, animations, GPS coordinates and feedback. The AR extends the visual depiction of the world around us. In this way, the real world is made interactive and yields to digital processing. Ronald Azuma, pioneer and innovator of AR technologies, defined three main properties of augmented reality:

- It blends virtual and real objects in the real world
- It allows real-time interaction
- Real and virtual images are accurately aligned with each other

An exact match of the real and virtual image, especially for real-time interaction and moving objects, is very difficult. As a result, some AR applications rely on real objects, e.g. plastic or paper cards with a special graphical element. The element allows software to identify and assign a specific object that enables users to manipulate it. Applications of Augmented Reality comprise many different fields and areas, such as augmented reality browsers (a sort of third eye), AR MMO gaming, or crime spotting and of course many educational areas. Using virtual information provided by software and real images and videos, this technology can offer instant learning by establishing its context in real-life situations.

Drivers

- Students' mobility and need for instant access to information
- Potential for intensifying the perception of reality through mobile devices
- Need for placing education in context, opportunity to learn from the surrounding environment

Advantages

- Personalises learning and makes it more meaningful by referring to real experiences
- Involves students, provides necessary educational interaction and offers much-needed support
- Helps students to understand content and information from the environment more extensively
- Creates realistic models, demonstrating a contextual, three-dimensional nature of the real world to students

Challenges

- Innovation and attractiveness of technology may result in less attention devoted to quality and content, which are of key importance for educational objectives
- It has not yet been tested or proven in which educational areas AR is especially beneficial

Examples

- SixthSense <http://www.pranavmistry.com/projects/sixthsense/>
- Buffalo Hunt <http://gameslab.radford.edu/ROAR/games/buffalo-hunt.html>
- GoS-kyWatch Planetarium <http://www.youtube.com/watch?v=S-yRIH-bHDw>
- ARIS Global Game Jam and ARIS games <http://arisgames.org/>
- St Mary's w Norton-le-Moors primary school in Great Britain using semacodes http://news.bbc.co.uk/local/stoke/hi/people_and_places/newsid_9371000/9371536.stm
- Examples of AR applications <http://www.digitaltrends.com/mobile/best-augmented-reality-apps/>
- Examples of AR use in education <http://www.educatorstechnology.com/2013/06/20-ways-to-use-augmented-reality-in.html>
- AR chemistry laboratory game <http://professor-why.pl/>

 *Related Trends*



Internet of Things



Holography



Industrial Revolution 4.0



Wearable Technology



Gesture-Based Learning



V. Modern education is multimodal

GESTURE-BASED LEARNING

GESTURE-BASED LEARNING

› Learning with your entire body ‹

Related Terms

Kinaesthetic learning, bodily-kinaesthetic intelligence, gesture-sensing techniques, active learning, education kinect, motion-based learning, motion-based learning

Gestures have always been a universal form of human communication. Using gestures is also one of the first ways for a child to communicate with other people. What's more, contact with a device through gestures is more natural for human beings than navigating it with a mouse or a keyboard. Many devices now detect almost every movement of the user, enabling the control of software by tapping or moving hands, making a specific gesture or changing the position of the device itself. It facilitates interaction with the software, transferring a person into a sort of virtual world and letting them instinctively manipulate the program and interact with it. Learning with the help of gestures has one primary advantage over many other methods: it doesn't allow passive participation during the learning activity. This way we can create and promote a truly interactive classroom.

In the technology of the brain-computer interface, the computer makes it possible to read EEG signals directly from students' brains and to facilitate direct communication. Brainwaves, their reading and potential reinforcing, are still an insufficiently used sphere of educational possibilities. Fast-evolving progress in the field, along with exploring the issue of dreaming, its stages and influence on learning may soon revolutionise our understanding of the way our brains handle the acquisition of knowledge.

Drivers

- Communication with the device, using the mouse and keyboard is an archaic method, not suitable for the next-generation appliances, such as smartphones or tablets
- Necessity of making learning more active (movement activates the mind) and interactive
- Need for an interface intuitive for humans

Advantages

- Learning by the kinaesthetic method leads to achieving better results by every student
- Encourages students to more active participation
- Develops kinaesthetic abilities and supports methods of active learning
- Shifts technology to the real world, where moving and reacting occur in a more instinctive way
- Helps students with special educational needs and disabled students (as a technology useful for developing skills or facilitating actions)
- Supports activities that develop social skills
- Promotes cooperation through involvement in group work and develops problem-solving skills

Challenges

- High cost in comparison with the benefits
- May distract attention from learning
- There is a need for space to prevent potential injuries

Examples

- Gesture-based computing in education
<https://education-2025.wikispaces.com/Gesture-Based+Computing>
- Nintendo Wii, Kinect, KinectEducation
<http://www.kinecteducation.com/blog/tag/kinecteducation/>
- Kinect Nat Geo TV, EyeMusic Project
<http://www.cs.uoregon.edu/Research/cm-hci/EyeMusic/>
- Virtual Autopsy table
<https://www.tii.se/projects/autopsy>
- Emotiv Epoc
<http://www.emotiv.com/>
- SixthSense
<http://www.pranavmistry.com/projects/sixthsense/>

 *Related Trends*



Mobile Learning



Edutainment



Game-Based Learning



Wearable Technology



New Generation TV Sets



V. Modern education is multimodal

SNACK LEARNING

SNACK LEARNING

› Small and tasty bites of knowledge ‹

Related Terms

[Bite-sized learning](#), [bite-sized training](#), [snack time learning](#), [snack-sized learning](#)

Snack learning is education served in bite-sized pieces, which means it's easy to swallow. This metaphor describes how a chunk of knowledge is conveyed to the student so that it's easy to assimilate because it doesn't exceed their ability to acquire knowledge. The student can concentrate on such a chunk more efficiently.

In this method of teaching, the student focuses only on a single topic, which is explained in a concrete and concise way, using clever examples. Bite-sized learning often involves the introduction of multimedia into the education process e.g. films, short animations or interactive presentations, which attract students' attention better than reading from textbooks. Snack learning is a method that uses the power of modern technology, especially mobile devices, common in today's world. The combination of devices and small chunks of knowledge allow the student to switch easily between the mobile device and desktop and back, anytime. Additionally, the division of educational content into small, easily digestible pieces ensures better acquisition of knowledge in the long run and allows the student to learn step by step, which usually results in a better pace of learning.

Drivers

- Limited ability to concentrate and short attention span among students
- Lack of time
- Need for multi-tasking
- Limited acquisition of knowledge and retention abilities
- Necessity of fast access to information
- Need to assimilate information divided into small chunks
- Review-refresh-reinforce process
- Learning in one's free time

Advantages

- Optimising attention span
- Maximising memory cycles
- Giving the possibility to learn step by step, improving student outcomes
- Reinforcement of learning

Challenges

- Lack of time for sufficient assimilation of material
- Superficial learning
- Lack of time for reflection and questions

Examples

- mobile Comprehensive Curriculum – an interactive mobile course in biology, chemistry, mathematics, physics, science and humanities designed for junior high school and secondary schools, by Young Digital Planet
- Educational games, animations, interactive tools
<http://mathsnacks.com/index.html>
- Snack Learning® by Metriss.com
<http://www.metriss.com.au/snack-learning>
- Snack-learning online courses
<http://www.mindtools.com/pages/club/BST.htm>
- Bite-sized learning for employees
<http://www.bitesizelearning.net/>

 *Related Trends*



STEM



VET



Mobile Learning



Competence-Based
Learning



Lifelong Learning



Radostaw Bomba

TIPS & TRICKS

TIPS & TRICKS

How can you prepare online multimedia resources in teams? Advice based on the “Art visualisation” (original name “Wizualizacja sztuki”) and “MedialabUMCS” projects.

- Dedicate one of your classes to the specification of the project's general subject (e.g. contemporary art, popular culture). It will help you avoid chaos
- To plan your actions more efficiently, order your information graphically, e.g. on a mind map. Use apps such as: coggle.it, Bluemind (<http://blumind.org/>), Exobrain (<http://www.exobrain.co/>)
- Use open source tools and apps that enable visual representation of data and creating infographics. This way you will make the projects more appealing. You may use apps such as Piktochart (<http://www.piktochart.com>), Ease.ly (<http://www.ease.ly>).
- Present numerical data using apps that enable easy integration of created visualisations on blogs and websites. Datawrapper (<http://www.datawrapper.de>) is a useful tool
- Encourage workshop participants to create digital narrations using various multimedia materials. You may use apps such as: MyHistro (<http://www.myhistro.com>), TikiToki (<http://www.tiki-toki.com>), Dipity (<http://www.dipity.com>)
- Form a discussion group using social networks (e.g. Facebook or Google) to make communication easier. Use it as a place of sharing knowledge, resources and information about online tools you could all use
- Create a website or a blog where you will publish your projects (e.g. <http://tumblr.com>, <http://blogger.com> or <http://wordpress.org>)
- Discuss the prepared projects together with the team during classes. If you want the participants to get more involved, upon presentation of collected materials put it to a vote and publish online those which receive the most votes
- Familiarise yourself with the idea of open source resources, free Creative Commons licences, public domain and discuss those subjects with the participants
- Create a shared document for the entire group using an online storage (e.g. Google Drive) that will contain open source Internet resources which could be used for the purposes of multimedia projects development



V. Modern education is multimodal

CASE STUDY

Creation and online distribution of multimedia resources in teams

Challenge:

The “Art Visualisation” (original name “Wizualizacja sztuki”) and “MedialabUMCS” projects were realized by the Cultural Studies Institute as a part of the “Multimedia and graphics editors” classes. A significant inspiration for the projects was the visualisation of data, social journalism, big data journalism and digital humanities. The principal aim of the project was to create an open creative space using new media to study, visualise and build digital stories about the culture (digital storytelling).

Process:

The “Art Visualisation” and “MedialabUMCS” projects were a part of a university course and the students had in all 30 hours to complete the task. Teams with a few members selected the subject of their multimedia project on their own. The only limitation imposed was the leading theme specified during a common discussion at the beginning of the course. After the subject area had been specified, the course instructor created websites for publishing the materials produced by the students. The following workshops were dedicated to the subject of open online resources. Then, the students were introduced to free tools that enable cooperation online (Google Drive, Dropbox, TitanPad) and visual presentation of the content on the Internet. They used, among others, tools intended for the analysis of cultural trends (Google Ngram Viewer), creation of infographics (Piktochart) and interactive timelines (TimelineJS), as well as more advanced tools for visualisation of networks (Gephi) and analysis of a large number of images (ImagePlot). The software is free and open source. The final result of the project was presentations by the students prepared in the form of visualisations.

Effects:

Both projects involved the creation of online platforms with the works of the students prepared during the classes („Art Visualisation” www.wizualizacjasztuki.umcs.lublin.pl and „MedialabUMCS” www.medialab.umcs.lublin.pl). This kind of projects requires the creation of a simple blog and the use of open source tools for data visualisation and digital storytelling that are available online.

In the land of Grimms' fairy tales – German language from a new perspective

Challenge:

The starting point is the obligatory educational projects at middle school. Students who wish to do a German project take part in a modern presentation of Grimms' fairy tales.

Process:

The task of the students is to prepare a film or stage adaptation of one of Grimms' tales in German. The script should be simple and fun and the story should unfold in the present reality. The project is worked on by groups of 4 to 7 students. They divide themselves into groups on their own and choose a leader who runs a blog updated on an ongoing basis and informs about the progress, the following steps, formal meetings with group members. The leader chooses the layout of the blog in consultation with the group. The students and the teacher sign a contract, determine a schedule and division of tasks among group members. They describe their work on the blog. There are students who take care of the scenography and props and those who are responsible for finding an open source backing track and sounds. Others take care of the video editing and finding open source pictures. There are also students who are responsible for the promotion of the project – they prepare posters, invitations and lead an online promotional campaign. The group members prepare the script and divide the roles together, but each student translates their lines individually. The meeting with the teacher takes place according to a schedule, usually once a month. To be able to discuss current issues the students create a group on Facebook.

Effects:

In the course of the project, the students undertake a series of tasks that enable them to practise many social competences – they learn how to work in teams, be responsible, help each other, be punctual, patient and assertive. They develop their IT and artistic skills and learn to respect copyrights. They often have to face their inner inhibitions and fears. For the purposes of the project, the students use high technology, apart from running the blog they record and edit videos, create slideshows. They create interactions on the LearningApps platform or flash cards with new vocabulary using Quizlet. Finally, the students present their project in the presence of an audience composed of the school community, teachers, parents and other invited guests. As the project is carried out in German, the students practise their language skills – speaking, listening and pronunciation – and learn new vocabulary.

Examples

Examples of blogs run as a part of the project:

Aschenputtel – Cinderella

<http://projektaschenputtel.blogspot.com/>

Schneewittchen – Snow White

<http://projektkrolewnasniezka.blogspot.com/>

Hansel Und Gretel – Hansel and Gretel

<http://projekthanselundgretel.blogspot.com/>

Creating an educational video blog called “Polish language manual”

Challenge:

Modern education should find and develop all the skills of a child. It should inspire and stimulate imagination and increase motivation. While it's a difficult task, it's not impossible. As a teacher of Polish, I am aware that my students may not love reading, they are surely not fans of spelling, they are not amused by word formation and they are not in their element when analysing rhetorical devices. What can you do to change that? You have to help each student find their means of expression and support them in the process of discovering and developing their linguistic and communication passions. A video blog is perfect for that.

Process:

A group of 12 students from the 4th – 6th grade of elementary school and 1st – 2nd grade of middle school participates in the project. The students who belong to the media group write scripts for educational videos associated with a given area of Polish (spelling, phraseology, word formation, literary genres etc.). The children have tasks assigned according to their skills and preferences. There is a lot to choose from: setting up a tripod, using the camera, memorising the lines, preparing the props, speaking in front of a camera, preparing the captions for stop motion, editing the videos, managing the blog (publishing videos, replying to comments) – there is something to do for each student regardless of their age and skills. The teamwork results in videos that constitute great study aids. The project was launched in March 2013 and is quite popular among children and teenagers.

Effects:

The instrukcjaobslugijezykapolskiego.blogspot.com blog is available to the public and at the present moment features more than 20 short video instructions created by children for children and concerning the knowledge and skills included in the core curriculum. Making educational videos is an excellent way to summarise and revise information for students who participate in the project and a great study aid which can be used at any time during the lesson (as an introduction, exercise or a summary) or at home (e.g. analysing the example given in the video as homework). Creative team work (distance work or work at school) favours the acquisition of basic skills such as reading, writing, speaking and listening. By acting creatively, the students have a chance to realize their potential, they are motivated, they learn consciously and teach online.



Wojciech Wiśniowski

MODERN EDUCATION IS TECHNICAL

MODERN EDUCATION IS TECHNICAL

Rapid and constant technological development is creating both great opportunities and great challenges for schools and for the whole education system.

But, in fact, is technology something schools really need?

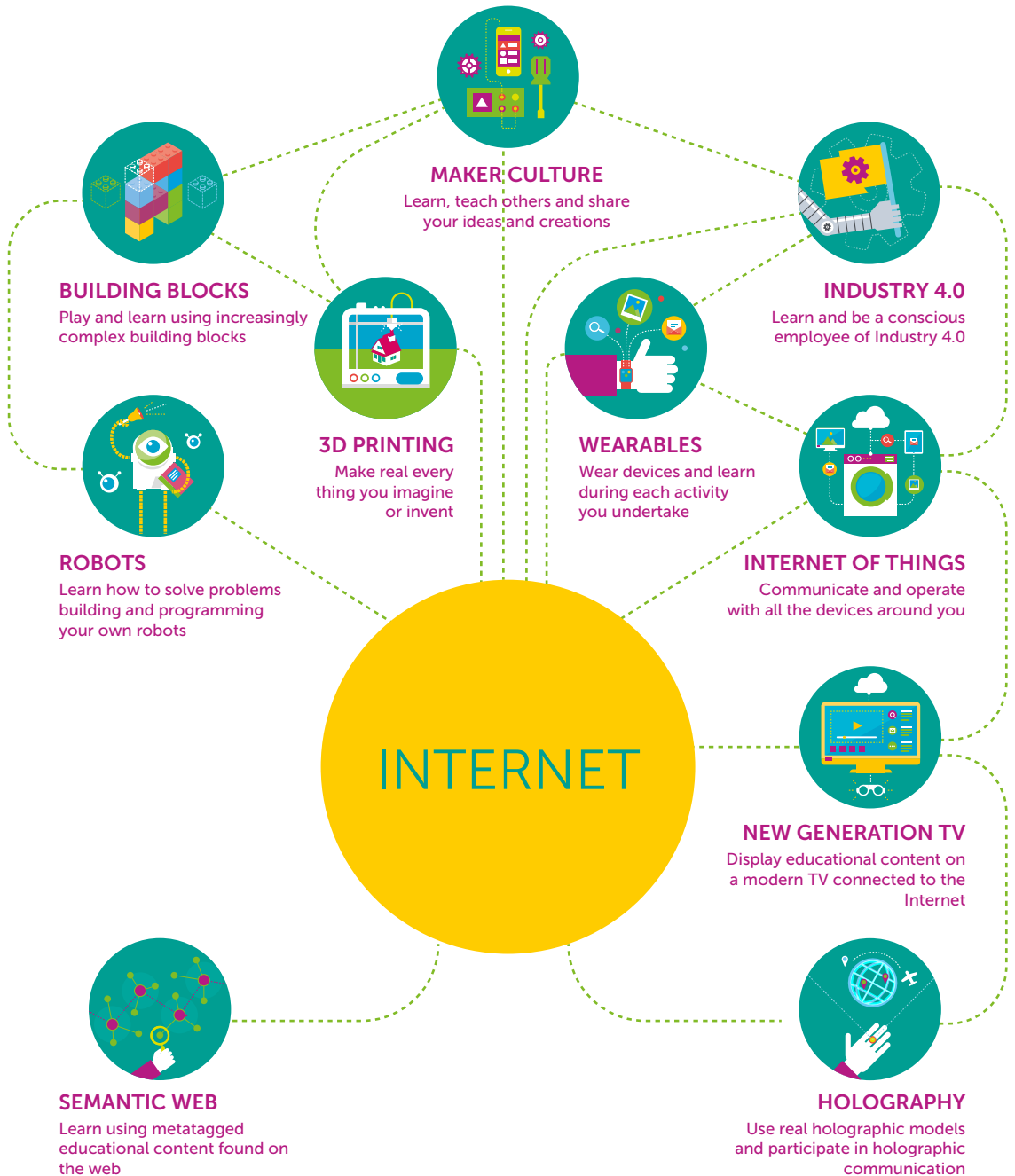
It's not an easy question, but it can be answered – let's take into account the pros and cons of the use of technology in education. The advantages include access to interactive multimedia content that can be easily found on the Internet, a wide range of useful online courses that are not otherwise available, or new teaching aids like robots, holograms or 3D prints. Additionally, mobile technologies, especially wearable technologies, create new opportunities so that learning is not confined to the school walls anymore and students can learn anywhere while performing everyday activities.

Technology also enables students to participate in various educational events around the world in an easy and almost costless way. The use of holographic telepresence gives more complete and more real experience of attendance.

Standing at the threshold of the next industrial revolution and facing the proliferation of the "Do It Yourself 2.0 culture" schools cannot ignore the future job market. Students want not only to learn in a relevant manner, but also to be able to do work that has real value outside the school. The Internet is a perfect medium for this and it can provide a wide-spread audience for what they do. Technology connects students to the world and offers new sources of inspiration that are often immediate.

On the other hand, there are significant challenges for schools which are often bastions of traditionalism in the surrounding digital world. Challenges related to the need to modernise the infrastructure are often primary but not the most important. The main goal is to convince all involved in the education of children about the suitability of technology use at school. And this means convincing teachers, educators and parents that technological solutions will help improve the speed and effectiveness of learning and teaching so that pupils can achieve better results.

Education in the Internet age



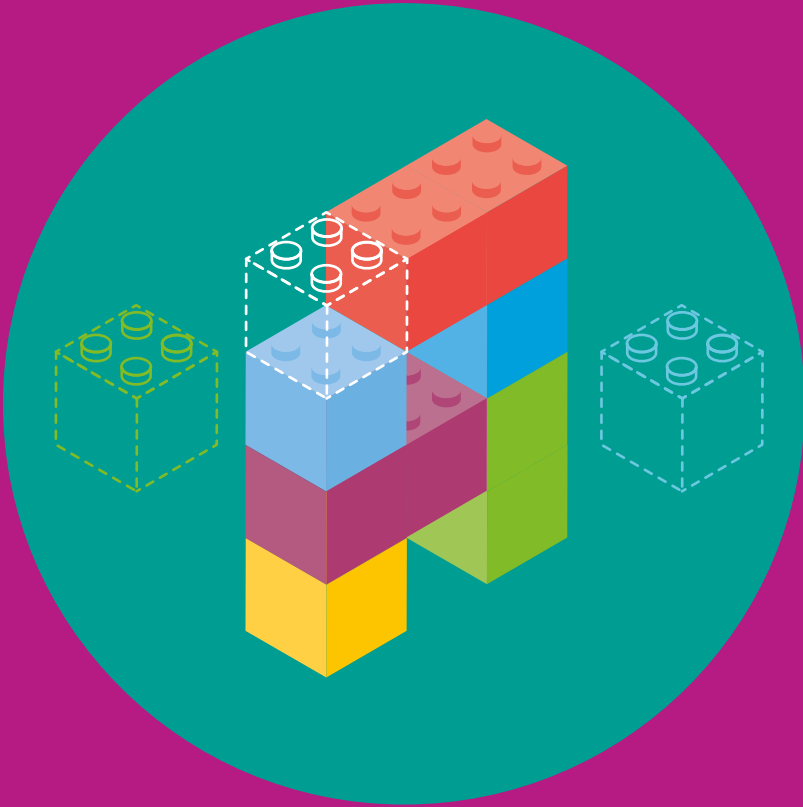
V

Modern education is technical

1. Building Blocks in Education
2. Robots in Education
3. New Generation TV Sets
4. Wearable Technology
5. Holography
6. 3D Printing
7. Maker Culture
8. Internet of Things
9. Industrial Revolution 4.0
10. Semantic Web

Tips & Tricks to make teaching and learning technical

1. Case Study: Building an educational lab



VI. Modern education is technical

BUILDING BLOCKS IN EDUCATION

BUILDING BLOCKS IN EDUCATION

› Another brick in the school ‹

Related Terms

Building bricks, blocks, Lego, Lego bricks, Lego Mindstorms

Everyone knows what building blocks are. Each and every one of us remembers these plastic or wooden polyhedrons from the past and probably still has them at home. We have contact with building blocks since our childhood and this is the moment when education with the use of the blocks starts. Precisely speaking, it starts from the moment when a child is able to hold a block in their hand and put it on another one, making their first structure.

As time goes by and the spacial skills, creativity and imagination of a child are stimulated, the structures become more and more complicated. After some time, letters appear on the blocks, thanks to which a child learns to form their first words and simple sentences. First blocks are usually simple polyhedrons, often wooden or made of foam, but when writing about building blocks, it's impossible not to mention the bricks manufactured by the Lego Group, whose product became a synonym for building blocks. These plastic elements created in 1949 are found useful not only as creative toys, but also in learning and teaching mathematics, physics or in engineering. The Lego bricks are used for teaching multiplication tables, creating models of devices and even building highly-advanced robots. But teaching mathematics, technology or mechanics is not the only way they can be used. The Lego bricks were also found useful in teaching languages, e.g. for building correct sentences in English, or for teaching biology and the structure of organisms. An interesting application of the Lego bricks is their use for teaching children life lessons about responsibility, trust, or right and wrong.

When talking about blocks we usually think about small physical objects existing in reality, but we have to mention a phenomenon of a certain interactive game. A game in which players can create their own worlds with the use of three-dimensional cubes (blocks) in the world of unlimited space – Minecraft. Thanks to its easy modification and considerable capacities, it became an object of sociological experiments and was also found useful in education.

Drivers

- Children's natural need to create and destroy objects – the possibility offered by blocks
- Universality of blocks and their availability in any conditions and any place in the world
- Need to apply teaching methods (combining play and education) that were different from the traditional ones

Advantages

- Development of children's creativity and spacial imagination
- Learning skills useful in everyday life – building a specific object, device: a car, a crane or a carousel and comparing the created construction to real objects
- Development of teamwork skills, creativity and creative problem-solving skills
- Hands-on learning and learning by doing thanks to the use of real objects

Challenges

- While building blocks seem to be useful in many ways in mathematical-natural subjects, a teacher has to be quite creative to use them when teaching the humanities

Examples

- Selection of the Lego bricks dedicated for education
<http://education.lego.com/pl-pl?nore-dir=true>
- Pozrobot Foundation – an organisation popularising the use of LEGO® Education bricks and LEGO® MINDSTORMS® NXT in the work with children
http://pozrobot.pl/wp-content/uploads/2012/05/Wykorzytanie_LEGO_education_16h_ekran.pdf
- Atkin Sp. z o.o. – a company providing schools and educational establishments with study aids and other equipment, also offering training on the use of LEGO Education bricks in working with children
<http://aktin.pl/wykorzystanie-klockow-lego-education-w-pracy-z-dziecmi-5467>
- “Laboratorium robotyki” – an organisation offering workshops for students and also trainings and courses for teachers on the use of LEGO robots and the EduRoboLab method at school
- Project ΛΕΓΩ-ΛΟΓΟΣ – a project originally addressed to students of the humanities in order to use it in the analysis of philosophical texts, now it adjusted for use in public education
<http://www.lego-logos.pl/>
- The examples of the application of LEGO bricks in education
http://www.lehighvalleylive.com/allentown/index.ssf/2011/12/allentown_elementary_after-sch.html

<http://education.wichita.edu/mindstorms/>

http://www.kathryncramer.com/kathryn_cramer/2005/07/teaching_perfec.html

http://qctimes.com/news/local/pv-elementary-school-students-learn-with-legos/article_32cae90c-0e8a-11e1-b988-001cc-4c002e0.html

<http://www.teachingvillage.org/2010/05/27/more-than-five-things-to-do-with-lego-in-the-efl-classroom-part-1-by-emma-herrod/>

- Minecraft in education – an example of teaching students with the use of modified Minecraft

<http://arstechnica.com/gaming/2011/04/educational-building-blocks-how-minecraft-is-being-used-in-the-classroom/>

<http://minecraftteacher.tumblr.com/>

Related Trends



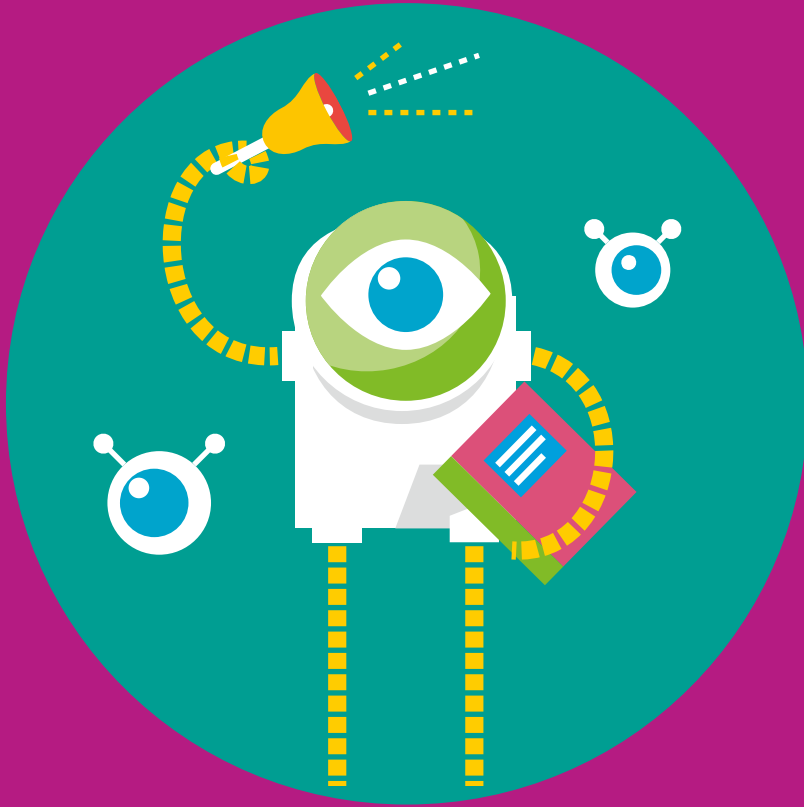
Relevance-Oriented Learning



Problem-Based Learning



STEM



VI. Modern education is technical

ROBOTS IN EDUCATION

ROBOTS IN EDUCATION

> Robots go to school! <

Related Terms

Educational robots, educational robotics

If we looked through the papers from the 1950s and 1960s and read about the way the world was supposed to look like in the future, the first thing we would notice would be the robots. Fifty years ago, everyone imagined that we would be surrounded by them in every area of our life, at home, at work, at school. The industrial application of robots that don't bear any resemblance to humans is wide and they've reached our homes as robotic vacuum cleaners or toys. But we still won't see a human-like robot walking a dog or obediently following its owner with heavy bags.

Although our dream of creating an artificial being is almost as old as humanity itself – everyone knows the Greek myth about Pygmalion and Galatea or the golem from Jewish folklore – the first functioning robot, a flute-playing one, was constructed in 1738 by a French inventor of the Enlightenment period Jacques de Vaucanson. Robots needed additional 250 years to enter the industry, but the first robots that actually resembled humans, both in terms of appearance and functions, came into being in the 21st century. Contemporary robots not only look like humans, but also dance, sing and can move on any terrain. They're now also slowly entering the world of education.

Secondly, during courses, workshops or clubs dedicated specifically to robotics organised by schools or non-profit and commercial organisations. Paolo Fiorini, Associate Vice President of the IEEE's Robotics & Automation Society's Education Committee, defined the use of robots in education as an intriguing combination of theoretical knowledge and practical experience.

Drivers

- Production on an industrial scale requires a number of simple but repetitive operations which people usually don't handle very well. This is how the idea to replace humans in performing difficult, boring operations was born. The words of the President of Fujitsu, Kazuo Murano, seem to confirm the importance of robots and robotics. The President said that in the 21st century these will be as important as the automotive industry was in the 20th century. The ability to construct and programme robots is slowly becoming one of the most essential skills today

Advantages

- Robots can be used at schools, especially for subjects such as mathematics (geometry in particular), physics, design and technology (electronics, automatics) and ICT (development of robot software)
- Working with robots helps students become more creative when solving problems. The students are not passive anymore, they're active and show initiative and independence, which accelerates the learning process. When there are robots in the classroom, students usually work in teams of 2 to 4. This helps improve communication and interpersonal skills. Cooperation skills and the ability to get a complex idea across are among the most important values on the contemporary job market

- Since a good robot is nothing without functioning software, constructing robots is an excellent opportunity for students to combine manual and intellectual work. It's quite common that the students who use ready-made software come up with their own ideas, modify it and make adjustments to make it suit their needs or expand it with new functions

Challenges

- Although there are more and more companies that offer robot construction kits at reasonable prices and a foundation for the development of open-source software for robotics has been founded, it's still quite an expensive activity

Examples

- HRP-4C – singing and dancing robot
<http://www.youtube.com/watch?v=xcZJqiUrbnl>
- Gepard – one of the fastest robots in the world
<http://www.youtube.com/watch?v=XMKQbqnXXhQ>
- Robot construction kits
<http://www.lego.com/en-us/mindstorms/?domainredir=mindstorms.lego.com>
- NASA Robotics Academy
<http://robotics.nasa.gov/RoboAcad/enroll.php>
- Courses in robotics for children
<http://www.roboty-dla-dzieci.pl/>

- Robots used to help autistic children
<http://www.bbc.com/news/education-20252593>
- Robots in the classroom at a South Carolina school
<http://www.foxnews.com/tech/2013/05/03/south-carolina-schools-bringing-robots-to-classroom/>
- Online store offering robot construction kits <http://www.robotshop.com/en/robotics-education.html/>

 *Related Trends*



Relevance-Oriented Learning



STEM



Project-Based Learning



VET



VI. Modern education is technical

NEW GENERATION TV SETS

NEW GENERATION TV SETS

Hybrid education

Related Terms

Hybrid TV, SmartTV, broadcast and broadband TV, interactive TV, NetTV, 3GTV, HbbTV, distance learning

The first TV set ever was made over 90 years ago and the first transatlantic television signal was broadcast 3 years later. John Logie Baird, the creator of the first TV set, surely didn't expect that his invention would become so popular and that it would gain so many new features. Although it seems that nothing has changed since the 1920s – the TV is still used to watch motion pictures broadcast by a TV station – the screen has become bigger, instead of monochrome images we have colours and what we see is a more exact representation of the reality. But in fact, there are some more significant changes.

Today, we're not forced to watch television passively. The hybrid TV, the so-called intelligent television system, which is a hybrid of a classical TV set and a PC, gives us the opportunity to interact or, if you will, it enables us to combine conventional linear services with non-linear content provided by broadband Internet access. This combination gave the viewers, who have been so far forced to passively absorb the content, access to a series of interactive services such as VOD (video on demand) and various websites or social networks. For example, while we're watching a football game, we can learn more about the players and the team history using a single device – a TV set, without any interruptions.

The most common application of the hybrid television is the use of the software pre-installed on our device. Each contemporary "intelligent" TV set has some applications you can use to watch content on e.g., YouTube or Vimeo with thousands of videos that can be used in the education process. Another interesting example of the use of hybrid TV is distance learning. Here, a high-tech TV set with a large screen assumes the role of a personal computer. In the simplest case, there aren't many differences between a class taught from a distance and a class taught at school. There are more students and the role of a teacher is assumed by a remote educator visible on the TV screen in the classroom. Two-way communication makes students' participation fully interactive and the use of extra materials displayed on the screen makes students more engaged in the lesson. One more

interesting example is the use of hybrid TV in language learning. The skilful combination of audio-visual transmission (e.g. a theatre play) and extra materials sent via broadband Internet enables more effective and holistic education.

If you connect intelligent TV to a tablet or a smartphone, you have even more possibilities to explore. For example, a teacher or a student is able to display on a large screen materials created beforehand and stored on a smartphone or a tablet by using one of the methods of wireless connection between the devices.

Drivers

- Development of audiovisual technologies, both when it comes to equipment and methods of sound and image transmission
- Tendency to combine various technologies in one device
- Need to ensure greater interaction that's not provided by a simple TV transmission

Advantages

- Lower (and still going down) cost of large screen TVs compared to an interactive whiteboard or a projector
- Both students and teachers are used to television and TV sets and "accept" the use of programmes and educational videos during classes
- Possibility to turn a rather boring TV course into something interesting and absorbing thanks to interaction

Challenges

- A contemporary flat screen TV often with a WiFi connection can be set or hung in any place, there's no need to arrange a special classroom as in the case of an IT lab
- A large screen TV does not offer much more than a typical personal computer besides the larger screen and higher picture quality
- Although the application of TVs at schools is generally accepted, some teachers and parents still have doubts about the large amount of time children spend in front of a TV
- You need to make an extra effort and demonstrate considerable knowledge of high technology to prepare dedicated materials that combine TV transmission and other content, which means that teachers are not always able to do that on their own

Examples

- Samsung apps for Samsung Smart TV sets <http://content.samsung.com/pl/contents/aboutn/appsTvIntro.do>
- An interesting way to make use of the online television theatre during German language classes <http://jows.pl/node/674>
- An interesting article about the combined use of AppleTV and iPads during school classes <http://www.emergingedtech.com/2012/02/apple-tv-in-the-classroom-the-new-smart-board/>
- A video which presents the use of Smart TV at a school in South Korea <http://www.youtube.com/watch?v=-0lyKK3MMBE>
- An article about the “need” to make use of Smart TV in contemporary education <http://www.bloggityboop.info/2011/04/why-educators-must-have-a-samsung-smart-tv.html>

Related Trends



Relevance-Oriented Learning



Social Media Learning



VI. Modern education is technical

WEARABLE TECHNOLOGY

WEARABLE TECHNOLOGY

Put your computer on

Related Terms

Fashionable technology, wearable devices, tech togs, fashion electronics, body-borne computer, wearable computers, ubiquitous computing, ubiquitous learning

Professor Kevin Warwick, a lecturer at Reading University, has recently become famous. The media named him the first cyborg in the human history because for a few months he lived with an implant in his nervous system. Although this is an extreme case, the number of devices that accompany us in our everyday life is growing and they're becoming increasingly close to our body. When it comes to the origins of wearable devices, they first appeared in the 1970s. One of the first electronic devices worn by people was a watch with an in-built calculator. From that moment on, people began to carry and wear more and more devices, some of them featuring a number of different functions. Today, the "intelligent" wearable devices include glasses, watches, buttons, brooches or bracelets.

Each of these devices is usually composed of three modules: a sensor, a display and data-processing elements. The combination of these modules offers unusual possibilities. The major advantage is that, as opposed to desktop computers or even laptops, wearable devices or devices integrated with clothing work all the time (you don't have to turn them on) and are multifunctional. Wearable devices may be easily applied in situations when the use of a laptop, mobile phone or a tablet is difficult or impossible, e.g. when you have to use both your hands but there's a need to access and display information at that specific moment. Thus, they will soon cease to be only novelties and gadgets and will enter many areas of life, starting from the work of a warehouse keeper through their use in industry, ending at fire fighting or medical practice. Wearable technology provides new opportunities in education. Learning doesn't have to be limited to a few hours at school on a Monday-to-Friday basis, but can be incorporated into each activity the student undertakes and can take place anywhere and anytime.

Drivers

- Development of technology that enables the miniaturisation of devices
- Human desire to always have indispensable things at hand

Advantages

- Constant access to the device and simple search mechanisms make for an easy and quick availability of information. For example, students are able to search and display information about a plant or animal they bumped into on a trip
- Possibility of creating “how to” guides from the perspective of the person who performs a given activity, e.g. preparing a dish from a cook’s point of view, making you feel like you actually took part in the act
- Students could have remote access to the classroom when they’re sick or to classes that take place a long distance from their home
- Ability to record a student’s progress in completing a task (also a traditional task done on paper) and provide voice comments. Such video could later be sent to the teacher or a classmate with a request for help
- Students are able to document trips to the museum, botanical garden or a farm using a simple camera or a camera phone. The use of voice commands and the fact that the device is situated close

to the user’s body facilitate recording and documentation and make one feel directly involved

- A “personal” display for each student makes it possible to further personalise the materials presented during a lesson

Challenges

- Wearable devices are still at the early stage of their development. They are expensive, uncomfortable and their battery life and performance are limited
- Wearable technology allows you to record the surrounding without it being aware of being recorded. This raises privacy issues and may lead to copyright infringement. This is why the use of such devices is banned in many public places
- Wearable devices are treated like gadgets. The users often get bored even before they get to know all the possibilities they offer. Research conducted by Endeavour Partners shows that one in three Americans gets rid of their smartwatch within 6 months of its purchase
- Just like computers and smartphones, they are at risk of attacks which may endanger the health or even life of the user as in the case of head-up displays in automobiles
- The application of wearable technology in education may change the learning system and face the contemporary education with a big challenge

Examples

- Google Glass
<https://www.google.com/glass/start/>
- Google Glass used in fire fighting
<https://www.youtube.com/watch?v=QPbZy2wrTGk>
- A competition organized by Intel for the best application of the Edison platform in wearable devices
<https://makeit.intel.com/>
- A few interesting examples of the application of wearable technology at schools
<http://www.emergingedtech.com/2014/04/imaging-the-classroom-of-2016-empowered-by-wearable-technology/>
- Useful tips for the use of wearable devices in education <http://www.crn.com/slide-shows/components-peripherals/300073560/5-ways-to-use-wearable-devices-in-education.htm/pgno/0/1>
- Google Glass Application List
<http://glass-apps.org/google-glass-application-list>

Related Trends



Mobile Learning



Augmented Reality



Relevance-Oriented Learning



Internet of Things



VI. Modern education is technical

HOLOGRAPHY

HOLOGRAPHY

› Smoke on water, fire in the sky ‹

Related Terms

Holographic technology, holographic telepresence, Three Dimensional Hologram Technology (3DHT)

Hatsune Miku is a singer from Sapporo in Japan who performed as a support act at Lady Gaga's concerts in 2014. Apart from an exotic tone, there would be nothing unusual about her, except that Hatsune Miku is not human. It's a virtual singer performing at concerts since 2010 as a hologram, and the voice it uses is generated by a computer programme. It's a great example of how holograms and holography appear in our everyday life. Although we probably shouldn't expect that in 2015 at our favourite cinema we'll be frightened by a holographic shark from the "Jaws 19" commercial known from the "Back to the Future Part II" movie.

The origins of holography go back to the beginning of the 20th century, but Dennis Gabor, a British scientist, is considered to be the father of holography and holograms. In 1971 he was awarded the Nobel Prize in physics for the idea of the three-dimensional photography developed in 1948 and first attempts to save and show images with the use of the holographic method. Holography is a technology derived from photography. It enables you to represent a three-dimensional object, illuminated by a beam of laser light, on a two-dimensional carrier (e.g. on a photosensitive film). Contrary to classic photography, while looking on a hologram recorded on a film we're unlikely to recognise what it represents, and in order to show the picture in space, it has to be illuminated with a beam of laser light. Common three-dimensional pictures – volume holograms (e.g. postcards) work similarly, although you don't have to use laser light to be able to watch them.

Holography slowly steps into the education as well and, for now, there are two types of its application. The first one is the use of holographic 3D models at school, also in the system of augmented reality, while the second one is the holographic telepresence, which is, in fact, an expansion of the video chat idea.

Drivers

- Holography, being an extension of the classic photography, gives greater possibilities to represent objects and scenes, making them more realistic

Advantages

- It provides teachers with three-dimensional visual study aids that can be used during school classes, also with the use of augmented reality technology – (mathematics – three-dimensional solids, chemistry - three-dimensional models of chemical compounds, history – visualisation of battle scenes or historical objects, biology - visualisation of human body organs, also those pathologically affected). It's important that the objects don't have to be holographic scans of objects existing in reality but they can be virtually created with the use of computer software
- Applications related to holographic telepresence:
 - › full three-dimensional live projection of processes (for example, a transmission for surgery students performed by a surgeon, without the risk of infecting the patient). In such a case, the use of holography gives more complete and more real experience than a normal television transmission

› “remote attendance”:

- delivering a presentation, a lecture by an expert for many classes and many students in the world at the same time
- virtual participation of the student in a lesson at school (especially important for students with motor disability)
- virtual trips to modern as well as historical places, possibility to observe historical events, which, combined with augmented reality, is a totally new way of teaching history, geography or nature

Challenges

- Although the first holograms were created over 60 years ago, they are not common in everyday life or at school yet. This is caused mainly by their high technological demands (e.g. the necessity to use laser light to illuminate images). Additionally, the 3D print technology, which is developing rapidly, becomes a product competitive to holography. A real object that can be touched gives more possibilities than a three-dimensional image. Holography and holograms are still more of a curiosity and until the technology of illuminating holographic images becomes more available, holography will remain a niche technology

Examples

- A company offering holograms for use in education (mainly the study of human anatomy)
<http://voxel.us/index.htm>
<http://voxel.us/educationalm.htm>
- A company offering ready-made as well as tailor-made holograms
<http://holorad.com/products>
- Hatsune Miku – singing virtual hologram
<https://www.facebook.com/HatsuneMikuOfficialPage>
- One of the examples of a holographic conference <https://www.youtube.com/watch?v=jMCR9xep81E>

Related Trends



Augmented Reality



VI. Modern education is technical

3D PRINTING

3D PRINTING

Print out your own future

Related Terms

Additive manufacturing, rapid prototyping, stereolithography, SLA, Fused Deposition Modelling (FDM), Selective Laser Sintering (SLS), PolyJet photopolymer, syringe extrusion, Direct Digital Manufacturing, desktop manufacturing

Some of you probably remember the “Star Trek” series. It featured many appliances “of the future” that nowadays are slowly becoming a reality. One of such inventions was a replicator – a device enabling you to create any object by changing energy into matter according to a specific recipe. Although today we don’t have home replicators yet, press and television provide us with information about printing out a piece of skull that replaced a damaged fragment of a bone, about creating a model of a baby foetus in the womb and yet another time about making a limb prosthesis out of elements printed out with the use of a 3D printer. While 2D printers are common at our homes, schools and work places, printing slowly steps into the third dimension that enables creating practically any object. The materials used for 3D printing are plastic, metal and organic; it’s more and more frequent to hear about “printing” organs with living cells. There are various objects created with 3D print and among them we can find nonsense figures, jewellery or elements for different appliances as well as practical objects or models and prototypes of new devices.

In the flat world, in order to print out a chosen text or picture, you have to first create it on a computer using a word processor or graphic software. The situation is similar in the case of 3D printing. Everything begins with a file with instructions for a 3D printer – Computer Aided Design (CAD). Such a file can be prepared by a person who wants to create an object with the use of a programme for 3D modelling, downloaded from the Internet or produced by scanning a real object with a 3D scanner. The set of instructions prepared in such a way is then sent to the 3D printer which laboriously adds subsequent layers of material here and there creating a desired thing only in places where it is desired, very efficiently and practically with no loss.

The technology of 3D printout brings huge possibilities of application at home, but has also a lot to offer at school. It's the next big step taking the teacher and students from a two-dimensional world of pictures or multimedia to a three-dimensional world of real objects created or adjusted by themselves. Thanks to the possibility of printing out the created project right away, students finally have the chance to immediately see and touch the objects, models or prototypes of the devices that they've created.

Drivers

- Need to create not only pictures, movies and music, but also real, three-dimensional objects
- Progressively lower prices of 3D printing appliances

Advantages

- Provides teachers with three-dimensional visual study aids, especially those illustrating difficult ideas, which can be used during classes (mathematics – three-dimensional solids, chemistry – three-dimensional models of chemical compounds or simulations of chemical reactions on real models, biology – visualisation of human organs in any sections, or creating any models, also those pathologically changed)
- Increases students' engagement by giving them the opportunity to experience not only graphical representations but real three-dimensional objects
- Improves hands-on learning and learning by doing thanks to the use of real objects, partially created for the needs of a particular situation

- By using 3D print for prototyping the students can produce realistic mini-models of objects designed by themselves. It's especially important for students interested in engineering, architecture or art
- Gives possibilities to create new methods of teaching and cooperation and also students' interaction, e.g. replacing the method of projects with "the method of objects" where the aim of a group is to create an existing and operating appliance or object. It gives more room for fully interactive actions

Challenges

- Possibility of piracy also in relation to real parts and components protected by copyright
- High costs of more advanced, realistic models of full colour palette or models made of materials with specific properties required by a project
- Logistic issues related to the use of a printer at school – a large number of complicated models combined with the amount of time it takes to print a 3D model may result in the necessity to plan printing in advance

Examples

- Shapeways (<http://www.reprap.org/>) where you can sell or buy projects and 3D printouts, order your own printout or hire a professional designer. The shop offers e.g. geometric solids, mathematical puzzles and gadgets that might be useful at school
- RepRap (<http://www.reprap.org/>)
 - a project developed in order to create a printer that would enable printing all the parts indispensable for the replication of the device itself, which would result in the evolution and gradual enhancement of the printer
- Dave White, a teacher who uses 3D printers in his work where he creates various projects and prototypes together with his students aged 11-18 <http://www.bitsfrombytes.com/usd/content/case-study-education>
- The project of British Ministry of Education whose goal is to make use of 3D printers at schools (21 schools took part in the project) in order to improve the education of students studying mathematical-natural subjects (STEM) and students engaged in industrial design, applied graphics and design study https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/251439/3D_printers_in_schools.pdf
- <http://www.makerbot.com/academy> a project developed by a 3D printer manufacturer in order to supply a device to each school in the USA and create a community where experiences and projects can be shared

Related Trends



Open Source Learning



Relevance-Oriented Learning



STEM



VET



VI. Modern education is technical

MAKER CULTURE

MAKER CULTURE

Do It Yourself 2.0

Related Terms

DIY culture, distributed manufacturing, maker movement, crowdfunding and crowdsourcing, hackerspace, makerspace, hacklab, FabLab

For the people of the 21st century, the punk culture or, according to some, counterculture is more like anarchy and destruction. Little do they know that during the second wave of punk rock's popularity in the 1980s, a new positive and constructive idea was born – the idea of DIY – Do It Yourself. Initially, the idea concerned the formation of new bands, magazines and organisation of concerts, but it also caught on among other people, besides the punks. What's interesting is that DIY found its breeding ground despite the fact that it landed in a society where "manual works" weren't very popular and were often limited to simple courses in making sandwiches and sewing on buttons.

Another example of the makers' society is the hackers' society. You may think that a hacker is a person who breaks into computer systems or into Pentagon's database. But in reality, it's a software engineer who looks for new ways of software development and shares source codes with other members of the society to give them a chance to improve them. The free and open source movements derive from the hackers' society.

But what does the term "do-it-yourself" refer to? It's generally used in relation to recipes and self-help books – how to do it? e.g. how to change a tyre or how to bake a blueberry cake. However, over the last several years, the term has gained a wider meaning and nowadays it refers to any kind of creative activity that results in making something on your own. So "do-it-yourself" today refers not only to tips for removing stains, but also creating handmade furniture decorations or making and selling handmade jewellery. Some people use the term in a more technical context – software development – often with the use of free software for electronic devices, such as printers, microcomputers, flying devices and robots. There is no denying that the Internet had a massive influence on the development of this culture. It made it possible to share the thoughts and ideas with others and create virtual and real communities. One example could be the fab lab (Fabrication Laboratories) communities. Fab labs are workshops where do-it-yourselfers, artists and engineers can indulge in creative thinking and production.

They are equipped with necessary tools and often provide technical support to people who want to make prototypes of new devices or come up with an invention. Fab labs also carry out educational activity by offering courses and trainings in various areas associated with education. There are also non-formal learning opportunities.

The maker culture was made even more popular thanks to crowdsourcing platforms such as Kickstarter, which provides people who are interested in a given idea with the opportunity to support its creator and provide funds to turn it into an actual product.

Drivers

- Natural need to make your own things for practical and artistic purposes
- Need to feel more individual and substitute mass-produced objects with things that are made on your own or suit your needs
- Need to switch from learning abstract and non-material things to learning practical skills which have been neglected over the last decades, such as designing and making your own things or software development
- Increasing prices of services and decreasing costs of designing and manufacturing your own products

Advantages

- Outdoor education as a complement to school education – teaching specific and useful skills, such as 3D modelling with the use of open source software
- Reactivation and popularisation of professions that are slowly disappearing in the contemporary society, e.g. courses

in metalsmithing

- Popularisation of knowledge and practical technical skills in children and teenagers by offering e.g. courses in robot construction, use of 3D printers and kayak construction
- Development of cooperation and communication skills among students who are all engaged in work on a common project
- Source of innovation and new inventions that become available on the market for a wide circle of consumers thanks to platforms such as Kickstarter

Challenges

- Maker culture, despite growing popularity, is still a niche movement
- Switching from consumer culture to culture in which everyone creates something for the community (participation culture) requires significant changes in our thinking
- When some people realise that they are producing valuable things, they do not want to share them with others for free. They want to use them in a commercial

way, which hinders collaboration

- Some people joke that those involved in the maker movement are mainly engaged in solving problems that no one has ever had
- DIY 2.0 movement involves new technologies that are usually expensive

Examples

- International Fab Lab Association <http://www.fablabinternational.org/>
- A short video explaining the idea of Fab Labs <http://www.youtube.com/watch?v=nOPGJ2VBCPo#t=16>
- An example of a Fab Lab in Tricity <http://www.fablabt.org/>
- The organisation which created Raspberry Pi computer – a cheap equipment used to teach software development and electronics <http://www.raspberrypi.org/>
- An example of the use of Raspberry Pi in education <http://pi.worldpossible.org/index.html>
- A few interesting examples of the use of Raspberry Pi <http://www.itpro.co.uk/mobile/21862/raspberry-pi-top-10-projects>

- An organisation which provides place and tools for communities to enable realisation of technical projects <http://familab.org>
- Non-profit educational hackerspace <https://www.noisebridge.net/>
- Free Software foundation <http://www.fsf.org/>
- Open Source Initiative <http://opensource.org/>
- The largest funding platform for creative projects submitted by the users <https://www.kickstarter.com/>

Related Trends



3D Printing



Peer Learning



STEM



Open Source Learning



VI. Modern education is technical

INTERNET OF THINGS

INTERNET OF THINGS

› When the iron talks to the washing-machine ‹

Related Terms

IoT, machine-to-machine communication, M2M, Internet of Smart Objects, Internet of Everything

I've just received an email from my fridge with a request to confirm the purchase of my favourite milk that's almost finished and there's not enough of it for the cereal tomorrow. I confirmed the order and in the evening a drone from the shop is going to deliver the milk along with the rest of my groceries, along with the washing powder my washing machine ordered for me yesterday.

Are we going to read such sentences in the near future? It's hard to tell. One thing is certain – the Internet of Things is slowly becoming a reality. We already live in a world where people are not the only ones to exchange information via the Internet. Year by year, more and more devices get equipped with modules aimed at communication through the Internet. Electricity meters are checked automatically, our health condition is monitored remotely, cameras are connected to the Internet to monitor the surroundings or watch a storks' nest 24 hours a day – these are just a few examples of devices using the web.

While the web originated in the 1960s, the Internet of Things was born somewhere between 2008 and 2009 along with the spread of tablets and smart phones which today generate most of the network traffic. According to estimates, in 2020 there will be around 6 billion people communicating online. At the same time, it's estimated that between 50 and 100 billion devices will be connected to the Internet.

The idea of the Internet of Things is based on 3 main assumptions: each device is able to identify itself among other devices, each device communicates with others and interacts with them. Thanks to the fact that various devices exchange pieces of information, process them and make appropriate decisions based on conclusions, new possibilities open up in everyday life, health care and medical treatment as well as at work and in education. Today, we might be standing on the threshold of social and technological changes which, on one hand, will modify the way we use the Internet, and on the other, will change the way we use and cooperate with the devices around us and the way we interact with the surrounding world.

Drivers

- The emergence of the Internet brought new possibilities of communication between people, and its development made it spread into many areas of life in such a way that, today, it is difficult to imagine life without the Internet. People quickly noticed the opportunities that come from the existence of a global network that allows communication and sending data over large distances basically without any delay. The miniaturisation of the communication modules made it possible to incorporate them into any device from video cameras, to sensors monitoring patients' vital signs, to commonly used devices. We quickly noticed that a human is unnecessary in the process of communication between the devices and, if at least some of them have decision-making capabilities, such a system can work autonomously

Advantages

- Providing assistance to students with special educational needs increasing their independence, reducing the scope of help required. For example, we could provide visually impaired students with cards recognised by each computer (in a computer room or at the library), which will automatically increase the font size, apply a theme with high contrast or even activate a system that reads texts aloud
- At some schools students already wear ID tags to distinguish them from strangers. If such an ID tag was equipped with a microprocessor and a transmitter,

it could keep students safe on one hand and on the other, it would enable us to significantly reduce the time wasted during each class on administrative tasks such as attendance checks. Additionally, in the case of an intelligent school it's possible to significantly reduce the costs of energy thanks to monitoring students' location and adequate heating and ventilation control

- Various interconnected devices a student has contact with can provide information about their behaviour, including after-school activities. The intelligent use of such information can form a basis for a better understanding of their needs and higher personalisation of the education process

Challenges

- The growing amount of devices connected to the Internet already causes problems. The present infrastructure is not ready to handle such a large workload. Even if we have a broadband connection, we can already observe delays and slowdown when many users are online at the same time. The need to assign an IP address to each device will make it necessary to switch to IPv6 in order to provide enough address space
- Safety issues are a key challenge for IoT. It's easy to imagine how important safe transmission and storage of data is when the devices gathering information are practically everywhere and work all the time

- Privacy issues are also a challenge. At present and for most of the time we can remain anonymous. If there were devices gathering information about us everywhere we go, being anonymous would be very difficult, if not impossible
- We need to change the way we think. Although today we agree to some automatic actions beyond our control that make our life easier, it will be difficult to accept the fact that a significant number of devices that we considered to be ours, make decisions that concern us in an autonomous way, only on the basis of the information gathered from other devices

Examples

- A video presenting the idea of the Internet of Things <https://www.youtube.com/watch?v=Cpbbrpgwu2I>
- A couple of interesting examples showing how IoT can change the future of education <http://bryanalexander.org/2014/09/17/what-does-the-internet-of-things-mean-for-education/>
- A CISCO report describing potential influence of the IoT on education http://www.cisco.com/web/strategy/docs/education/education_internet.pdf

- An article about “the Internet of Things” pilot at British schools <http://goo.gl/8Q2SBW>

Related Trends



Relevance-Oriented Learning



STEM



Project-Based Learning



VET



Wearable Technology



Augmented Reality



VI. Modern education is technical

INDUSTRIAL REVOLUTION 4.0

INDUSTRIAL REVOLUTION 4.0

› Building tomorrow's factories today ‹

Related Terms

Industry 4.0, Cyber-Physical System

When in 1698 an English blacksmith Thomas Newcomen was signing documents that incorporated a company manufacturing steam engines, he surely didn't expect that in the future he would be called a revolutionist or the father of the Industrial Revolution. Although he was the true inventor of a steam engine, it's generally considered that its inventor was James Watt. James Watt introduced essential improvements in Newcomen's project that made it widespread and started the first industrial revolution. The revolution concerned primarily the means of consumer goods production which, instead of being made by hand in relatively small quantities, began to be manufactured mechanically in factories on a large scale (industrial production). As a result of this improvement, economical, social and cultural changes occurred.

The second industrial revolution was not as groundbreaking as the first one and involved the introduction of education and technology achievements into production. Electrical devices and the use of assembly lines broke up work into many simple operations performed by workers. This formed a prologue before the third industrial revolution that began in the 1970s and involved the increase in the production process automation. New automatic assembly lines were developed which, thanks to the application of electrical and digital control and management systems, enabled practically human-free production.

It seems that three industrial revolutions are enough for 250 years of industrial production. But it looks like we're on the threshold of the fourth one, sometimes referred to as industry 4.0. The name was first used in Germany. The idea was initiated by the German government and its aim is to make German and European industry and economy more innovative and competitive.

The main idea of this revolution is to form networks between devices and further digitalise production in order to introduce quick changes and modifications to the process to suit the current needs of consumers verified online on an ongoing basis. The revolution will also make the process decentralised and self-organised in terms of both people and devices engaged. The industrial revolution 4.0 is an answer to the maker culture and makes use of the idea of Internet of Things.

Drivers

- Today's consumers want personalised goods created especially for them but are not willing to pay the price of handmade products. The assembly lines are suitable for production of a large quantity of identical products, so they often don't meet the expectations of consumers, i.e. producing short lines of goods and modifications in the process to make them as individual as possible. Producers are forced to modify the entire infrastructure to allow for the changes in the process and reduce the time of their duration to a minimum. This type of operations should be automatic to make them less troublesome. One of the ways to do this is connecting the machines into a network (Internet of things) where the planning system, production and inventory management are interrelated
- Growing competition on the part of small manufacturers (craftsmen) who are able to create a product that meets the expectations of consumers thanks to the development of technology (e.g. 3D print, direct sale on the Internet)
- Changes in the demographic structure of the society. The number of young people on the job market is decreasing as the education system changes, and so

is the significance of vocational training decreases, which leads to a shortage of qualified workers who could be employed in the "factory of the future"

Advantages

- Industrial revolution 4.0 offers the most to consumers who want to give up mass-produced articles that look and function the same, regardless of their manufacturer
- The need to train qualified workers requires closer cooperation between companies and schools and education facilities providing training to future specialists. Such a system would ensure that students are prepared to handle their job and are employed directly after graduating from school. On the job market, a qualified worker is valuable and doesn't join the ranks of the unemployed, which is a common problem in the industrialised European countries
- Placing greater emphasis on interdisciplinary education of students, especially when it comes to their skills and not only the knowledge. Combined with the relevance-oriented learning, it increases the learning pace and improves its efficiency

Challenges

- Establishing stricter requirements for future employees calls for a change in students' education profile. In order to train the employees of the future we should place greater emphasis on education based on concrete examples from everyday life and raise the significance of teaching STEM subjects (Science, Technology, Engineering and Mathematics) in terms of contemporary high technology
- High investment costs of the modification of production structure and the consequent changes in the training of future employees
- Lack of qualified teaching staff, especially when it comes to modern vocational training with the use of high technology
- Need to change the training system for the employees of future factories, which may be hindered by the present educational system

Examples

- The German Federal Ministry of Education and Research – information on industrial revolution 4.0
<http://www.bmbf.de/en/19955.php>
- An article providing a description of the challenges for the participants of industrial revolution 4.0
<http://www.criticalmanufacturing.com/en/newsroom/blog/posts/blog/industry-4-0-winners-and-losers#.VGSAC8k3U5c>

- A presentation on the main Industry 4.0 ideas and the significance of adequate training and preparation of employees that will work in the “factories of the future” http://www.kth.se/polopoly_fs/1.481977!/industry%204.0%20-%20full.pdf
- Presentation of the integration of Industry 4.0 rules into the education system
http://www.imove-germany.de/cps/rde/xbcr/imove_projekt_international/d_Education-Forum-2013_Session2_Wuerslin.pdf

Related Trends



Internet of Things



Maker Culture



STEM



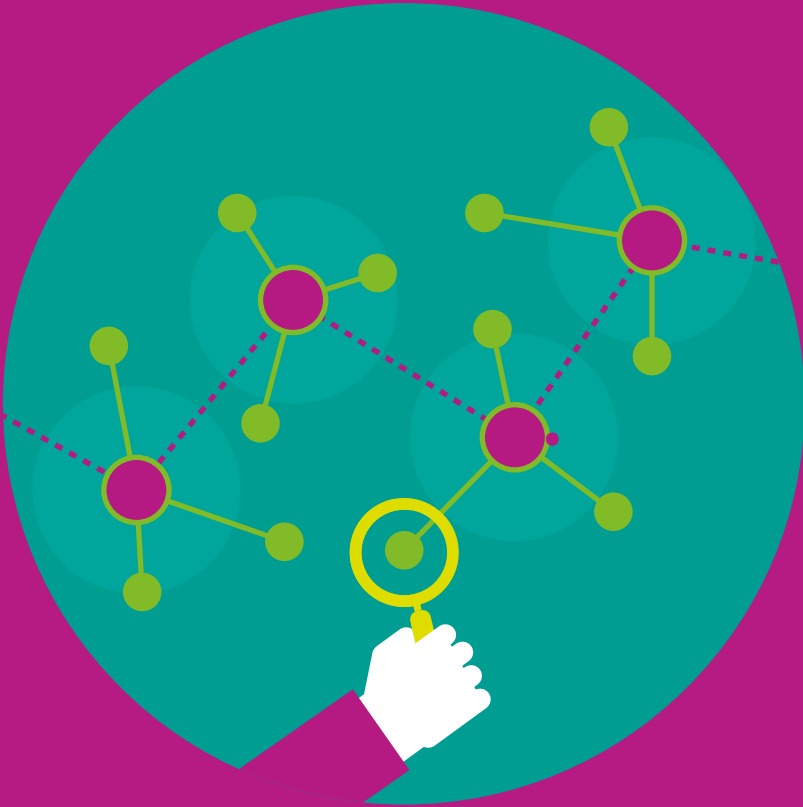
Wearable Technology



Augmented Reality



Learning to Code



VI. Modern education is technical

SEMANTIC WEB

SEMANTIC WEB

› When the machine doesn't get the human ‹

Related Terms

Web 3.0, concept-based WBES, web-based educational systems, educational Semantic Web

On 3 February 2011, the IANA (Internet Assigned Numbers Authority) organisation announced that it had just assigned 5 remaining address blocks to local registrants. This means that its address pool has been used up. Obviously it does not mean that the Internet is over but this shows how many people use the Internet on an everyday basis. According to estimates, there are currently 3 billion Internet users and the data collected by Netcraft Ltd. in January 2014 shows that there are nearly 870 million websites in operation. This clearly shows the amount of information available on the web is huge and very diverse. The Internet offers everything you might need – from ads and cat videos, to websites with useful information and music, to online stores, news websites and poetry.

The thing that was supposed to be the basic function of the Internet, i.e. the possibility to find information, has become a bit difficult. Any word you enter into a search engine will produce a huge number of results that frequently don't even correspond to the information you intended to find. This results from the simple fact that our computer is not able to understand us and will never know what we meant when we entered "mouse" into the search engine – whether that was the animal, a cartoon character, computer mouse or Thomas Albert Mouse, our neighbour, about whom we wanted to find out a thing or two. A human being will handle such a situation by selecting appropriate information or by modifying keywords. But the communication between machines in such a situation is a problem. And it's not about a simple data exchange between servers but a more complex system in which the communication takes place between machines that have never interacted before and have not been adapted in any way.

The problem was observed some time ago and since then there have been various attempts at solving it. One of the solutions proposed was the Semantic Web – a project developed by www system founder Tim Berners-Lee and realised by World Wide Web Consortium (W3C) directed by Tim.

The aim of the project is to create and popularise a standard that would provide the content on the Internet with supplementary information (meta data) to ensure that the machine can process adequate information in a given context.

The authors of the project intended to enable computers to understand the online content, help the user find appropriate information and give an opportunity to combine information in a new way. Thus, the semantic web would be a kind of an integrator of various types of content, applications or systems. The use of semantic webs opens up new possibilities of application in many areas, such as online stores, news websites, blogs or education, both formal and informal.

Drivers

- Need to put online content in order
- Popularisation of Internet use as a basic information source for people who are not proficient in technology use
- Need to make the communication between a person and a computer more "human"

Advantages

- Uniform and consistent description of the content gives a huge opportunity to both creators and recipients of educational content
- The creators may come up with content that can work on various platforms, can be easily found by the users and is compatible with materials from other sources
- The recipients of such content: educators, teachers and students, will be able to easily search for desired materials on the Internet at exactly the time they need to

Challenges

- The huge amount of information on the web is equal to the huge amount of meta data that has to be processed, created or added to the existing content, often with the modification in the content itself. Creating new materials or describing the existing materials with metadata entails huge costs. The processing of such an amount of data requires high computer performance
- The language and terms people use are often ambiguous, imprecise and can't be quantified. For example, "flushed" may refer to a person having a healthy reddish colour, but it can also refer to a person that's pale but has got a lot of money. If we add up metaphors, we lose even more precision necessary for the correct functioning of machines. We should remember that it takes people years to master a language and there are still misunderstandings in simple everyday conversations that result from different interpretations of the words used. Considering the subjectivity of some words, e.g. "nice" or "cold" the people who want to create a semantic web face a massive challenge
- For many years, some companies offering content and software have used their original, closed standards to avoid the

formation of cheaper or free alternatives to their products. Popularisation of a single standard could cause problems and be a challenge for the semantic web.

Examples

- World Wide Web Consortium’s website – an organisation developing and popularising WWW standards <http://www.w3.org/>
- A document with a description of Semantic Web concept and a summary of the technologies and terminology associated with semantic networks http://www.researchgate.net/publication/30509768_Semantic_Web_status_model/links/02e7e51c0cfc84077d000000
- A website with a collection of schemata used by webmasters to improve their search results <https://schema.org/>
- LRMI – Learning Resource Metadata Initiative – project aimed at the creation of a uniform metadata dictionary for education <http://www.lrmi.net/>
- Examples of the LRMI application <http://www.lrmi.net/the-specification/examples>
- An article about semantic web-based education <http://www.ijcaonline.org/volume26/number2/pxc3874206.pdf>

Related Trends



Process-Oriented Learning



Interdisciplinary Education



Project-Based Learning



Open Source Learning



Internet of Things



Grzegorz Stunża

TIPS & TRICKS

How to organize and manage a media Lab?

- Don't be afraid to dream – there are no bad ideas and brainstorming is a great way to start. Little problems of the local community or the willingness to come up with innovative solutions can be a great motivation to work
- Prepare a list of interesting subjects and ideas you want to put into action
- Convince others to work with you. You can all learn new things together or realise a practical project that could change something in your neighbourhood or could be useful at work, at school or in everyday life. If there are more of you, it will be easier to buy necessary equipment, e.g. a 3D printer or components for building computers, robots or mobile devices (tablets, smartphones etc.)
- You may focus your efforts on one subject and carry out activities in the company of people who have similar interests, skills and knowledge. You can also cross the borders of various disciplines. If you have an idea for a new app but you're not good at programming, find people who are skilful programmers. If you design websites but you're not good at advertising, you should find people who are proficient in the use of social media, etc.
- Financial support is essential but if you have no chance of getting a subsidy because your group is an informal team of enthusiasts, you can realise the initial projects thanks to voluntary contributions. Try to engage a non-governmental organisation, a cultural institute, a school, a company interested in your idea or think about making your group a formal one
- Check what equipment the people who are interested to join you have. It is not always necessary to have a computer lab or professional recording devices. Smartphones and tablets enable you to collect and process data immediately
- There's an abundance of free apps and services you can use – e.g. for the purposes of educational projects you can use simple online tools that will help you cooperate, publish and promote the content. You don't have to be a computer specialist to use such tools
- If you want your work to be professional, try to attract to the team not only specialists in brilliant ideas and those who have broad knowledge but also people who have specific technical and engineering skills. Together you will be able to create concrete, technically refined products



VI. Modern education is technical

CASE STUDY

Building an educational lab

Challenge:

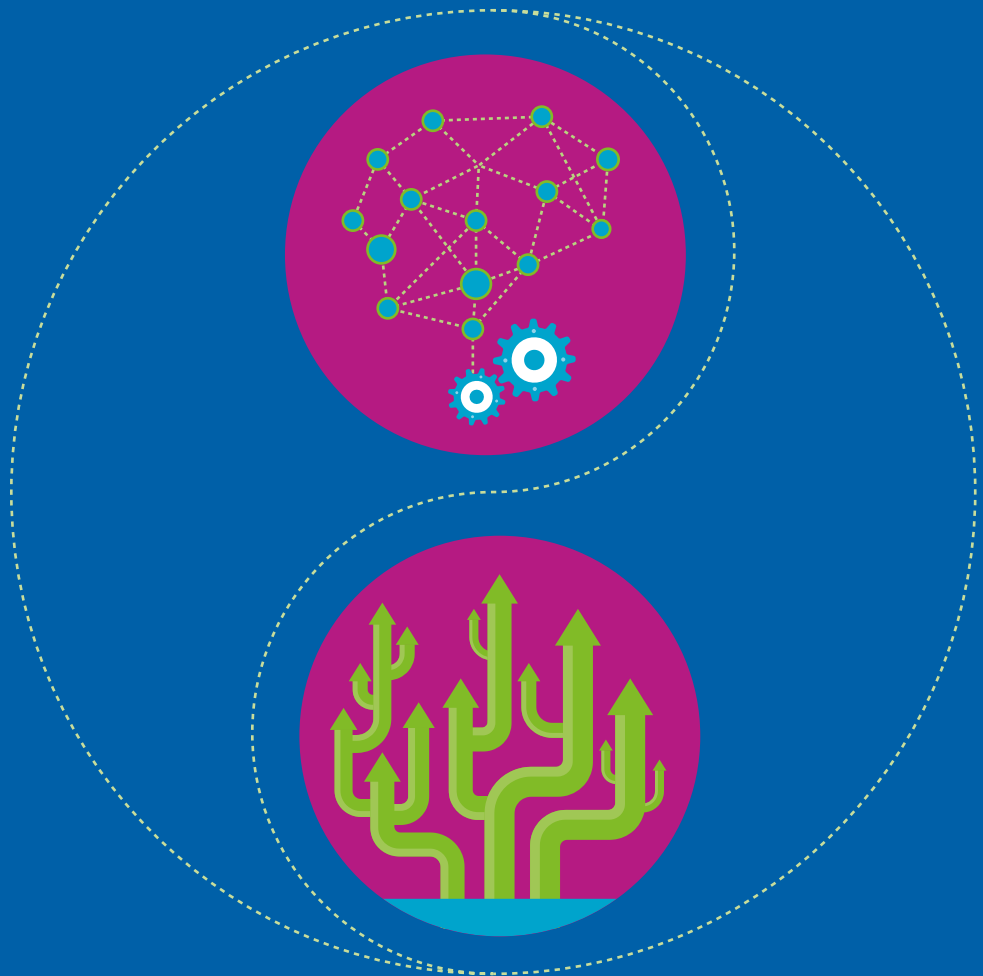
Nothing stands in the way of combining learning with new media, 3D printers, designing apps, educational games and creating a rich educational environment. Media labs, where educational experiments are conducted may focus their efforts on the development of specific skills or serve as a place of cooperation for people with various interests. They may function as temporary or permanent institutions or a series of operations initiated at the roots.

Process:

“Culture camp 2.0”, the first media lab was held in 2010 in Chrzelice, Poland. The workshops held over the course of a few days were divided into sections according to their theme: pure data (concerning the interactive audiovisual installation solutions), fluxus (concerning programming language for creating visualisations), arduino (concerning, among others, the development of music controllers) and the digitisation of cultural heritage. Among the participants of the latter workshop, persons who did not have any engineering and programming skills prevailed. There were two groups which worked for a few days. The first group worked on collecting data on the local community while the second group worked on the map of Chrzelice. The first group recorded interviews with the residents, scanned old photographs, took pictures and prepared audiovisual landscapes. The second group focused its efforts on the use of mobile phones and smartphones with GPS capability for the purposes of drawing an accurate map of the village. To this end, the participants moved around the village on bicycles recording the routes they followed and flew kites with an attached smartphone to create documentation from a bird’s eye perspective. After the materials had been collected, the first group attended to processing the scanned photos, records and videos and published them online allowing for further publishing on the web. The second group, with the help of a computer specialist, put the data they had gathered on the map at openstreetmap.org

Effects:

The result was a website with all visual and sound materials students had gathered, and a map of Chrzelice (so far unavailable at Google Maps and Open Street Map). The important historic sites, interviews and pictures were put on the map as interactive points to enable its users to benefit from the data collected during the materials digitalisation.



Jolanta Gatecka, Marzena Żylińska

MODERN EDUCATION IS OPEN-MINDED

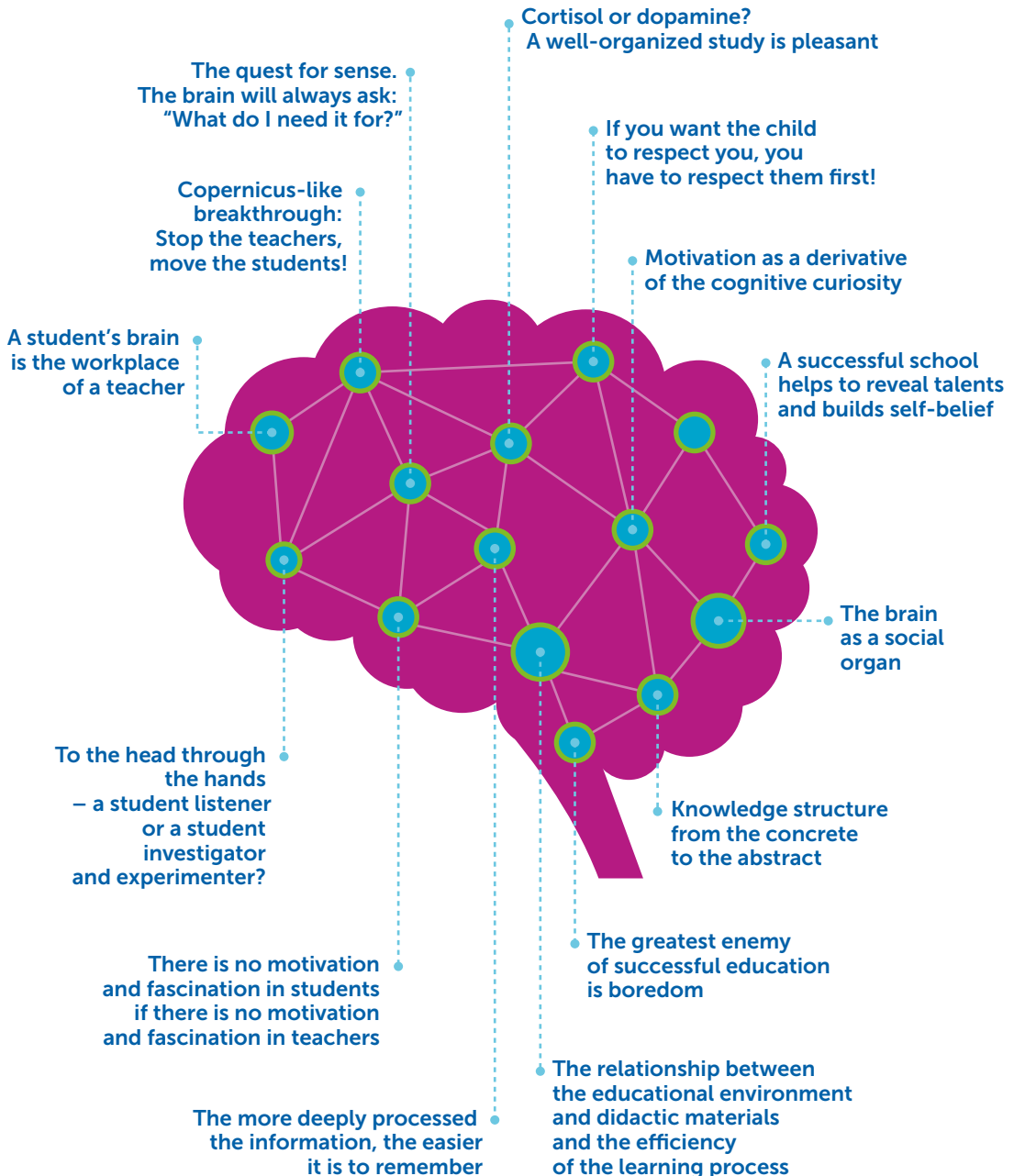
MODERN EDUCATION IS OPEN-MINDED

The history of education is familiar with changes of the system implemented on the basis of a single research results, for example, regarding class size. Nowadays, thanks to the growing evidence from neuroscience, we know more about the brain than we ever did before. We understand better how complex the learning process is and – what’s perhaps the most important rediscovery – how individual it continues to be, regardless of the standardisation efforts across all of the school systems. The shape of education, or – more to the point – the shape of the learning process, depends on the balance between the biology of the brain, the environment, social, cultural and psychological aspects of human behaviour, academic aspects of particular problems or challenges we are trying to learn and many more. Considering the above, it could seem impossible to structure such a system in a standardised way across the country and expect positive results. Recently it has been stated that these are far from satisfactory in many countries. Public opinion is becoming more and more negative as more people learn about the problems in the standardised approaches.

We need to be cautious though and remember what we’re dealing with here: the learning process is extremely complex and it shouldn’t be changed radically, based on some research results. A lot of research is conducted in a particular environment and transferring it to different surroundings may not bring the same results. What seems to be the most important is educating people in the learning process itself, providing them with an understanding of its complexity and allowing individual choices at least to some extent. The utmost issue is, of course, the teacher training in all the latest discoveries regarding the learning process, helping them knowledgeably decide what to do in specific circumstances they encounter in their classrooms.

However we should also be aware that the school system fits the needs of many learners (some say about 40% of learners thrive in a school environment). We also need to remember that the origin of the system was based on a compromise between the needs of the state, the army and the church. The world has changed since then and so have the brains of learners. We need to prepare a new set of choices for them. And we already have many examples of alternative approaches to education.

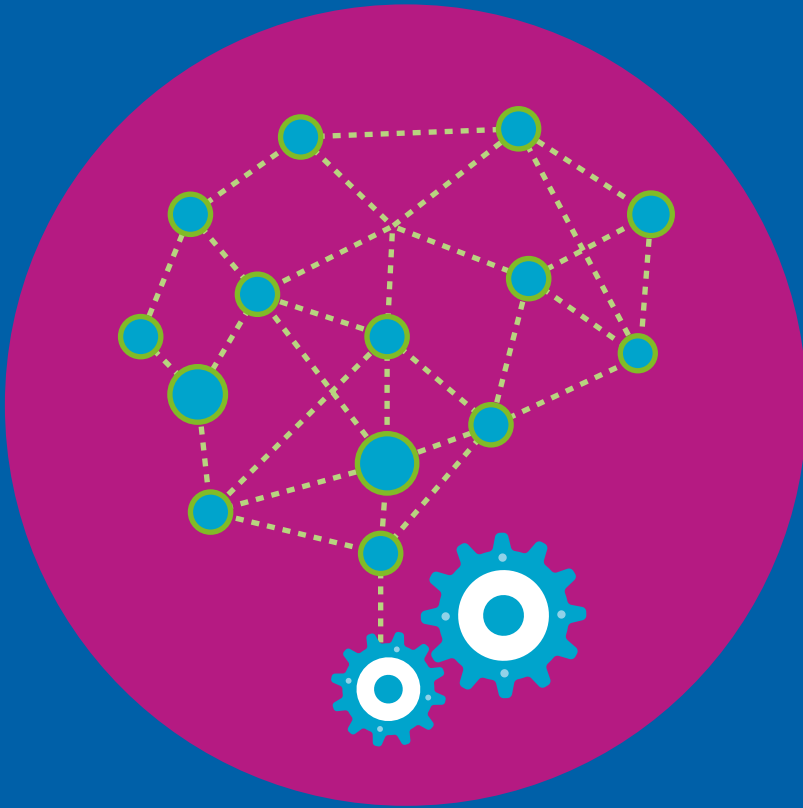
The power of human brain



1. Neurodidactics, i.e. what aids and what hinders the learning process
2. Alternative Approaches to Education
 - a. Finnish Education System
 - b. Montessori Education
 - c. Waldorf Education
 - d. Reggio Emilia
 - e. Democratic Education
 - f. Schools for Talented and Gifted Students
 - g. Homeschooling and Unschooling
 - h. HighScope

Tips & Tricks to make teaching and learning open-minded

1. Case Study: Working with emotions and fulfilling educational goals
2. Case Study: KALEJDOSKOP – a democratic school in Tricity (Poland) – what do children learn when they have freedom of choice?
3. Case Study: “Help me do this on my own” – “The Island of Imagination” project



VIII. Modern education is open-minded

NEURODIDACTICS

i.e. what aids and what hinders
the learning process

NEURODIDACTICS

i.e. what aids and what hinders
the learning process

» "The student's brain is the workplace of a teacher" «

Related Terms

Neurons, neural network, neurotransmitters, limbic system, dopamine, neuroscience, brain-based learning, neuroeducation, neuropedagogy, neuropsychology

Yesterday's teachers in yesterday's schools teach today's students how to solve the problems of tomorrow.

For over 20 years now we've had devices that enable us to look inside the human body, including the brain, in a non-invasive way. This has allowed us to learn more about the mechanisms that control the learning process. Research conducted by neurobiologists shows that the present transmission model of education makes it difficult for the brain to learn. Many teachers believe that the biggest problem of present-day education is lack of motivation. This is why we should first find out why students lose the desire and motivation to learn at school and why so many of them complain of boredom.

The knowledge about learning mechanisms should be passed on to people who are involved in the education of young people as soon as possible because, as professor Manfred Spitzer said, "The student's brain is the workplace of a teacher". Teachers should know their workplace along with what aids and what hinders the natural learning process. Otherwise, though in good faith, they will probably make some mistakes.

Motivation as a derivative of cognitive curiosity

The strongest incentive that pushes people to learn about the world is curiosity. Anything that is atypical, intriguing or unlike the things we know naturally attracts our attention. Our brain learns when the neurons communicate. And such communication requires

the presence of chemicals known as neurotransmitters. They also enable the formation of new connections between the neurons. The brain cannot be forced to release these substances. And there is no need to force it either. Every time we see something interesting, the neurons immediately release neurotransmitters. It means that the effectiveness of the learning process is influenced both by the quality of the learning environment, and the methods employed as well as the educational content. Neutral text with monotonous descriptions, definitions and rules creates a lot of problems for our brains.

We know enough about learning mechanisms to understand the necessity to create new-generation educational content based on our knowledge about the brain. The choice of tasks and exercises is equally important. The type of activity will decide whether or not a lasting trace in the limbic system will be left.

Our brain learns all the time, but not in a way schools expect it to!

The assumptions of neurodidactics

- The structure of the neural network is shaped by the activity so the brain of each student has different capabilities
- The human brain is a social organ, which means team work should prevail at school
- Students' potential cannot be realized unless educational content is interesting for them and unless they are guided by internal motivation
- The brain always asks about the point of the thing to be learnt
- A well-organised learning process is enjoyable and induces the release of dopamine
- The deeper we process the information, the easier it is to remember
- Emotions are markers of experiences. A good school should provide students with experiences

 *Related Trends*



Personalisation in Education



Student-Centred Learning



Outdoor Education



Problem-Based Learning



Project-Based Learning



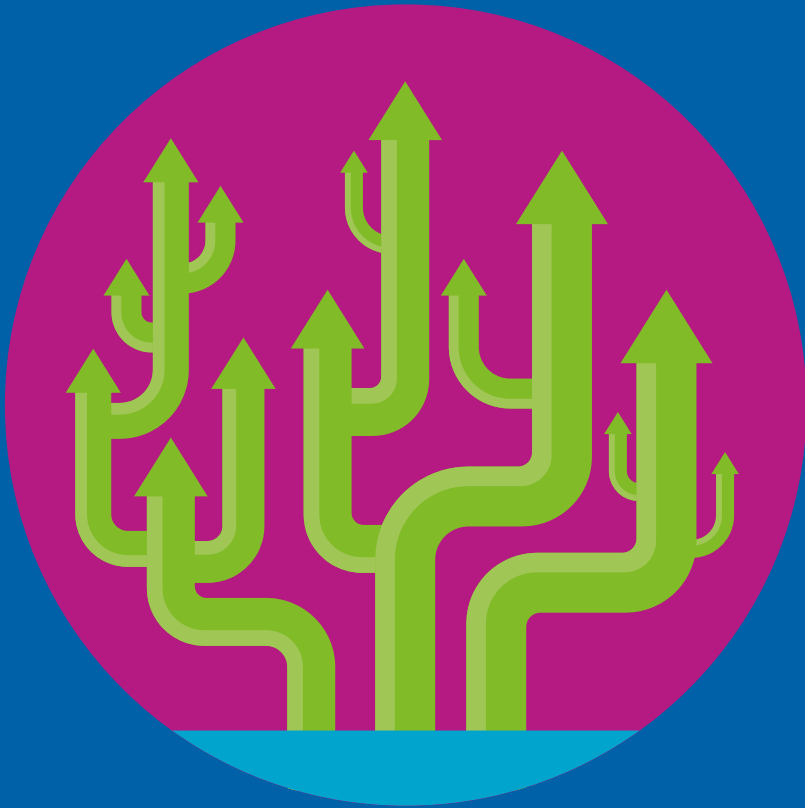
Alternative Approaches
to Education



Informal Learning



Interdisciplinary Education



VIII. Modern education is open-minded

ALTERNATIVE APPROACHES TO EDUCATION

ALTERNATIVE APPROACHES TO EDUCATION

› From Montessori to unschooling ‹

Related Terms

Alternative education, non-formal educational systems, informal learning, self-directed learning, open education, progressive education, non-traditional education, charter schools, independent schools, home-based learning, experiential learning

The very fact that there are so many related terms referring to various, more or less conventional approaches to education confirms how important this subject is. It is hard to find one common feature in this abundance. We would probably be right to say that all these approaches put pressure on values other than those in traditional schools, in which the exam results often count the most. It is quite frequent for such values to be the so-called abilities of the 21st century (e.g. responsibility, solving problems, critical thinking, creativity). Due to their distinctiveness (often the systemic one), those forms of education are not burdened with so many rigours as traditional schools, and the proportion in the number of children in relation to the teacher is much lower than in an average class. Moreover, such schools differ in the architecture and the interior design, which – as shown by research – has an influence on pupils' engagement and effectiveness.

Alternative schools are also created because of the need to differentiate the approach, e.g. due to the level represented by particular students or the level of their adjustment to the environment of the traditional school. This is how schools for talented and above-average students are created, as well as schools (or alternative programmes) whose main goal is to reduce the number of pupils who fail to complete their education. An increasing number of such projects and programmes clearly show the lack of adjustment to the needs of students in traditional schools. This lack of adjustment is visible particularly in countries where the society culture does not value purely academic

abilities in themselves if, for example, they have no practical use in everyday life (e.g. in Brazil or in India).

There are a lot of approaches to the education system and the same goes for the profession of a teacher. It seems that everyone should first answer a question what they expect from a school and a teacher. In reality, each of us appreciates different values. However, in the end, it's not us but our children who are going to go to those schools and it's their future that we have to take care of. To do it properly, it's necessary to understand the process of learning and human development. These factors are also indispensable for exercising the role of a parent, which is the only profession in the world for which nobody prepares us. But most of all, we have to remember that children are not small adults. Children abide by their own rules resulting from, among others, biological aspects of their development (such as nerve cell myelination, which affects the speed of signal transmission, or the development of particular areas of the brain), emotional and mental issues, social interactions and the family situation.

One thing is obvious: there is no standardised structure that will ensure proper development to everyone. It will not ensure it even to half the students. But understanding the learning process will give us the freedom to choose wisely. Because, if we are able to understand – on the basis of observation, conversations, environmental reaction – what happens to our child, we will not be afraid to “experiment” by sending our child to a different school or organising additional activities, help or, at least, play with peers.

If we assume that schools should reflect everyday life (because, above all, they should prepare for it) and a teacher should maximise the process of learning with any means available, it will become easier to decide if our children are in the right place. If we add to that the knowledge about the elements (aspects, processes) indispensable for the learning process to be effective (which will be described in the following chapter), then the support of a child's development will cease to be incidental and fraught with the sense of failure and frustration.

In reality, many of the educational forms described below with their shape and attitude remind us of the first rural schools, in which one teacher had to handle a group of students of different ages and at different levels. A close relation, which was established between the pupils and the teacher, allowed the teacher to differentiate the process of teaching appropriately, understand their pupils better and choose relevant tools for them. At the same time, the situation created by such schools somewhat automatically made students cooperate and help each other. In the USA, such schools still function (there are several hundred of them).

Drivers

- Devaluation of diplomas and certificates
- Better understanding of the learning process combined with critical evaluation of the traditional education effects
- Desire to be different, to obtain qualifications other than just those offered by traditional schools (e.g. the ability to work in groups, communicative skills, solving problems or independence)
- Child's difficulty to get along in a traditional school
- Difference between the traditional school values and the values of a particular family or a social group

Advantages

- Greater freedom and closer contact with the pupil favour the learning process and the independence of learners
- Focus on the development of independent thinking and solving problems or creative approach to them make students handle day-to-day life better even without good results in the external exams
- Students' greater freedom of choice and the possibility to influence their own learning process enhance engagement and often lead to the increase in the sense of responsibility and causation

Challenges:

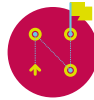
- Alternative forms of school are not suitable for everybody, particularly due to social reasons. There is no wide social spectrum in such schools because particular forms of non-traditional education attract particular social groups which appreciate similar values
- Particular forms of education often require increased effort or participation of parents, which is not always possible
- Trust is a challenge. The increase in the number of such schools is not considerable due to limited knowledge about them, their innovativeness and the fact that they can differ significantly from one another. Parents are reluctant to experiment on children. They often assume that, since they've been brought up by traditional schools and they've grown to become decent people, the traditional system works after all
- Making the right choice. Over the last years we've seen an upward tendency in the creation of non-traditional schools in Poland. Parents decide to send their children to such schools but sometimes they don't understand what they agree to. The choice is often motivated by the disappointment with traditional methods. Disappointment as a starting point is not always a good basis for making correct decisions. It's quite common that after several months the child is taken away from the school

Examples

- Proeja Transiarte in Brazil – in one of the schools in Ceilandia district a group led by professor Lucio Teles gives classes implementing technology and art in the subjects required by the curriculum <http://www.proejatransiarte.ifq.edu.br>
- School in the Cloud, i.e. the project of Sugata Mitra that combines his two earlier projects – SOLE (Self Organised Learning Environments) and Granny Cloud – into one <https://www.theschoolinthecloud.org>
- St. Paul's private school in Brisbane, Australia (which is in fact placed within the main education system) where the holistic approach to education is reflected, among others, by the fact that the school teaches professional skills (e.g. woodwork, graphic design or welding) <http://www.stpauls.qld.edu.au>
- Chugach School District Alaska, where performance-based learning was implemented http://www.chugachschoools.com/pages/Chugach_School_District
- Whole Education – a partnership of like-minded schools <http://www.wholeeducation.org>
- Scouting <http://www.scouting.org>
- The One Room School House Project <http://orsh.net>

- Artistic Secondary Schools ALA in Wroctaw where the cooperation with students is based on pedagogic tutoring <http://www.ala.art.pl>

Related Trends



Project-Based Learning



21st Century Skills



Problem-Based Learning



Interdisciplinary Education



Peer Learning



Storytelling with Technology



Outdoor Education



Edutainment

FINNISH EDUCATION SYSTEM

> Out in the spotlight! <

The Finnish education system and approach became famous after the PISA* test results were published. Finland is also high in the rankings of the OECD and UN (Human Development Index).

Add to that the fact that Finnish children spend the smallest amount of time at school (and a lot playing outdoors), there are no state exams until the students are 16 and homework is reduced to a minimum and it will become clear why the Finnish system is currently in the spotlight.

The Finns pay a lot of attention to the child's early development and consider this period to be critical in the development of cooperation and communication skills. They emphasise the need to recognise the individuality and needs of each child.

Education has a broad interpretation and is not limited to schools. For example, the parents of a newborn are encouraged to read aloud to their baby and are provided with books as a part of the so-called layette. The state encourages people to read for pleasure. Finland publishes more children's books than any other country and foreign films on TV are subtitled to make children read. The profession of a teacher is desirable and considered prestigious as teachers enjoy high social status. Finnish schools prepare students for life. The classes are not very numerous (around 20 students), from the very beginning the students are taught two foreign languages and have even 11 hours of practical and art classes, such as visual arts, music, cooking or woodworking and metalworking, every week.

Since the schools are usually quite small, teachers are able to get to know each student. This allows them to consult with each other on the approach and methods in case of any problems.

Advantages

- The scale of the “phenomenon” concerns the entire country and the results were obtained at the early stage of performance evaluation when the children were not being prepared for any tests yet (this shows the true nature of the phenomenon)
- The Finnish system guarantees the equality of rights: each child, regardless of their social and financial status or place of residence, has equal chances and is offered the same education
- The differences between the worst and the best students are the smallest in the world (OECD)

Challenges:

- The Finnish system developed for over 40 years and caused profound social changes. It's the result of the social approach and conditions characteristic of this country
- Teachers' activities are not standardised or written down in any manual. There's no instruction to the Finnish method. Its power lies in the individual approach of well-organised staff
- Some countries whose education systems focuses on preparing students for tests began to top Finland in the ranking, which exerts some pressure. It's important for the system not to give in to it and not introduce ad-hoc changes aimed at restoring Finland to its top position. Lack of standardisation is the

strength of the Finnish system and a thorn in the flesh of other countries

Examples

- Finnish National Board of Education
<http://www.oph.fi/english>
- Finnish Ministry of Education and Culture
<http://www.minedu.fi/OPM/?lang=en>
- Study in Finland
<http://www.studyinfinland.fi/home>

MONTESSORI EDUCATION

> Learning in interaction with the world <

Maria Montessori was broadly educated, having studied, among others, mathematics, physics, medicine (including paediatrics and psychiatry) and philosophy. She learned about pedagogy on her own. She took care of sick children as well as children with learning difficulties and developmental disorders. On numerous occasions, she advocated women's rights. These experiences gave her a wide perspective and a new, fresh look on the education of children.

Upon having learned about the existing theories and approaches, she initiated tests and observations of children that took her many years. The research concerned, among others, the physiology of the nervous system, psychology, clinical psychiatry, anthropology, anatomy and special teaching methods. It all enabled her to develop methods and tools so universal that they are successfully used to this day. These tools refer not only to the learning process itself but also to personal development. Montessori observed phenomena such as concentration, the willingness to repeat some activities, following school rules, engagement or sensitivity to the surrounding environment. She gradually increased the number of practical classes and adjusted the surroundings to children's capabilities. She also laid down the rules aimed at transferring the responsibility for the learning process and the surroundings (the garden and the classroom) onto the children themselves. Thus, she gave them more freedom and created a predetermined order of each day in which activities followed each other. Such an approach to independence created autonomy and internal motivation in students which in turn increased their potential and helped them understand new problems. The complete development of children treated with respect, as individual beings, attracted the attention of specialists. Education is not a process performed by a teacher, but rather a natural process experienced by every human being as a consequence of interacting with the world. The activity of an individual is the basis for development.

The teacher's role is to observe the child to be able to pick the right materials for each student. This stimulates the child and aids the independent development adjusted to their needs and skills. A school is a place where the child should feel safe and at ease. The appearance of rooms is very important. The world around the child is structured in such a way as to ensure that the child has perfect conditions for development without the intervention of a teacher. The essence of the method is the child's freedom within

collection of materials and study aids that enable them to perform all the activities on their own. The independent work helps develop concentration skills and consequently boosts social competences.

Montessori observed that children go through stages, or development phases, during which they are particularly sensitive and prone to certain stimuli and interested in specific types of activities. As a result, they can focus on them without any problems. Montessori listed the following periods: acquisition of language, sensory refinement, walking, social behaviour and interest in small objects. The role of the school is to prepare children for each of these stages and the teacher's role is to observe the child to be able to provide them with support and lead them towards its interests and developmental needs. In the early development (until six years of age) there is a large pressure on sensory stimuli and in the following period there is a transition from concrete things to abstract ones.

Advantages

- Children learn through independent action, not absorption or acceptance of other people's ideas
- Teachers can be provided with thorough training. The method is precise and provides solutions to various situations according to the materials used
- It is one of the few methods that stood the test of time and suits multiple cultures. The assumption is that the child naturally strives towards knowledge and – in favourable conditions – is able to broaden it without limitations. Groups include students of various ages (three age groups), which favours the development of mutual learning
- The approach takes into consideration the psychological, social, emotional and cognitive development of a child. The beautiful, safe and well-organised surroundings with well-thought-out study aids ensure that the child can develop

freely within the set boundaries and favour the development of independence and freedom of choice

- The possibility to follow internal needs not only boosts self-esteem, confidence and self-discipline but also develops the ability to adapt to the rules laid down along with the others and the respect for other people

Challenges:

- Children are not allowed to experiment with didactic materials (which are self-correcting) which deprives them of the chance to learn from mistakes
- Free creativity is often limited to the artistic sphere and extra classes (which follow the "Montessori part" of the programme)
- The name Montessori in the name of the school does not guarantee the right approach to children, teachers' training,

appropriate materials and study aids or the essential structure and look of the surrounding

Examples

- Mountain Valley Montessori, North Bend, Washington, USA
<http://mountainvalleymontessori.com>
- Christian Montessori school and pre-school, Gdańsk, Poland
<http://www.montessori.gda.pl>
- Bergamo Montessori Schools
<http://www.bergamoschools.com>

WALDORF EDUCATION

› The power of free expression and artistic development ‹

Waldorf education is based on the philosophy of Rudolf Steiner, the founder of anthroposophy, i.e. raising awareness through inner development. The Waldorf approach concentrates on the comprehension of the human and its evolution. According to the philosophy, there are three stages of a child's development. Additionally the intellectual, emotional and artistic progress of a child is linked to practical skills. The early development of a child involves practical, creative and experience-based activities. In elementary school, the efforts are focused on the artistic and social areas and students are provided with support in analytical and divergent thinking. High school focuses on a critical and empathetic attitude towards life through teaching maths, natural science, visual arts, languages and humanities in their broadest sense. The development of a human being is linked to the world and society. Waldorf schools aim to create adequate conditions for full advancement and provide support at each stage of the process ensuring that the passions and personality of a student are progressing while keeping in mind their personal freedom. The artistic area is particularly important, including eurhythmics in which music and words are substituted with specific gestures.

At Waldorf schools, there are no marks or student books and the main classes are conducted by the same teacher for a whole year. The classes are divided into the so-called epochs, i.e. three- or four-week cycles. When planning the (original) curriculum, teachers often take into consideration the temper of their students and adjust the methods accordingly. Marks are replaced with detailed descriptions and students' written assignments. The first exams take place in high school and are necessary to enter higher education facilities. However, in some countries (e.g. in Poland) students take exams on a yearly basis to be promoted to the following grade.

Advantages

- Taking care of a child's overall and free (stress-free) development, sensory stimulation, a lot of practical and outdoor classes
- Development of an ecological approach towards the world, protecting children from growing up too quickly (enforced by the contemporary world); focusing on artistic development
- Emphasis on interpersonal skills, discussions, cooperation, building relations

Challenges:

- The idea of the school is based on close cooperation with parents; teachers visit students at home, and prior to admission to school, parents complete a detailed application form and undertake for example not to allow the child to watch television or use the computer
- The teacher performs all the pedagogical roles and is responsible for the education progress taking care of various aspects of development, including intellectual, emotional and spiritual
- The schools are sometimes accused of sectarianism due to a large spiritual load; Waldorf school communities are small and often closed

Examples

- Colmar Waldorf school
http://www.steiner-waldorf.org/ecoles_steiner/colmar.html
- Three Cedars
<http://threecedarswaldorf.org>
- Waldorf school in Bielsko-Biała, Poland
<http://www.szkoła-waldorfska.bielsko.pl>

REGGIO EMILIA

› The support of community ‹

The name of the approach derives from the name of a village in northern Italy where the educational philosophy placing a child and their development in the centre of attention came to existence. The founder of the philosophy – Loris Malaguzzi – assumed that every child enjoys cognition and learning. The feeling should be strengthened to ensure the process is pleasant even when it requires effort on the part of the child.

The Reggio Emilia philosophy emphasises artistic expression and contact between a child and a teacher. The assumption is that children should be allowed to control their learning process and should be provided with the opportunity to learn through touching, moving, listening and observation. According to the system, children learn through exploration of the world and building relations with other children and objects, and through establishing a close relationship with the surrounding environment. They should always be allowed to express their opinions and needs. Exploration of the world is based on respect, responsibility and takes into consideration the massive contribution and support coming from parents and the rest of the community. The environment assumes the role of the third teacher and the teachers themselves are guides, careful observers and documentarians, but also profoundly educated pedagogues. Their constant development guarantees a high level of education while holding on to their freedom and ability to change the approach (which is adapted to the individual needs of each child). Teachers set goals and predict the students' reactions to the activities and projects, shaping the surrounding environment accordingly.

Documenting the child's progress and the multitude of communication forms ("the hundred languages" /means of communicating one's thoughts, ideas and solutions – from Loris Malaguzzi's poem) play an essential role. The child is perceived as the creator of their own learning process. The adults who are present in the life of children provide them with support, care and sense of security, but don't impose any direction of development.

The essential element of the approach are projects which are often long-term and have no specified final result at the beginning, which enables freedom of exploration and gives a chance to follow the child.

Advantages

- Comprehensive approach to a child's development, including cultural and social aspects
- Teachers encourage various paths and styles of thinking, analysis, concluding, communication and expression. The aim is to understand the child better and establish a better contact between the child and the adult

Challenges:

- The role of a teacher is outlined in a very general way. Their performance is to a large extent conditioned by an individual approach, education, observation skills (building and analysing documentation) and their translation into practical work with a child
- Strong involvement of the community, especially parents, is required which sometimes might not be possible.

Examples

- Reggio Children
<http://www.reggiochildren.it/?lang=en>
<http://reggioalliance.org>
- Red Solare Guatemala
<http://www.redsolareguatemala.com>

DEMOCRATIC EDUCATION

> Freedom and autonomy give me motivation <

Democratic schools are built on the basis of democratic values such as: freedom to make decisions about one's life, equality of all participants, justice, respect and trust. They aim to provide the child with a chance to shape their own educational path.

According to the tradition initiated by John Locke learning should not be a burden and nobody should be forced to learn as it may only cause discouragement. Jean Jacques Rousseau supplemented the approach with additional elements, such as the human desire to explore and learn about things that intrigue us or things we consider useful. The essence of the process lies in the exploration which enables us to form our own opinions instead of repeating the opinions of other people. Experimenting and experiencing help to develop comprehension skills and show how to draw conclusions. The emphasis is shifted from didactics itself to a sense of happiness.

Initially, the approach was used only for children from wealthy families. Only in the 19th and 20th centuries schools based on the philosophy and aimed at children from poor families or orphans came into being. For example Leo Tolstoy founded a school for the children of peasants in Russia and in Poland Janusz Korczak founded the Home of Orphans.

In 1921, Alexander Sutherland Neill founded the oldest democratic school in operation (Summerhill) assuming that it is the school that should adjust to the students' needs and not the other way round.

Democratic schools are run on the same terms by everyone, including all children, even the smallest ones. The issues concerning organisation are discussed on regular meetings during which everyone can suggest a subject to discuss or an initiative to take. Teachers act as supporters and inspirators, treating children with respect and not forcing them to do anything. Disputes and conflicts are solved collectively, sometimes with the help of a special tribunal or committee composed of community members.

There is no school timetable or guidelines determining what children should learn on a given day. Children pick subjects and issues themselves and look for answers using the resources available at school, including the teachers. They assume the responsibility for the learning process while the teacher's role is to inspire, show the possibilities or direct the cognitive process. Usually, schools have two or three sets of topics and meetings prepared for a given day and the students may choose those which are interesting for them. They are encouraged to come, but there's no obligation. The classes often take place in the so-called competence groups (composed of children with similar competences, which should not be confused with age).

Specialists in given subjects are usually employed permanently. In the course of the year there are also people employed for short periods of time. These are enthusiasts of specific fields, creative and interesting people who want to share their interests and know how to arouse curiosity in young people and inspire them. The schools often feature dormitories.

Advantages

- Freedom and independence combined with abundance of proposed activities increase motivation
- Taking up activities that are often not present in conventional schools.
- Young people learn to respect the freedom of other people and to solve conflicts
- They have all the time they need, which enables them to delve into the subject that interests them
- The conventional didactic material is realized faster (often at the end of the education process, before university entrance exams), the majority of time can be dedicated to the search for and development of passions, experiments and interpersonal relations

- Small communities positively affect interaction and give students the chance to be themselves, develop at their own pace and be accepted by the others

Challenges:

- Not every child is ready to assume responsibility for their own learning process
- In a way, students are limited by the scope of interests of the people around them as these are the people who inspire them and provide stimuli to explore a given subject
- Sometimes it's hard to direct a young person towards a subject that lies outside the scope of their interests or skills (i.e. sometimes the initial difficulties might be an obstacle)

- In many countries (including Poland) democratic schools remain outside of the conventional system, which means students have to take exams outside of their school to be promoted to the following grade. For some this is controversial, especially if young people don't understand why they have to pass additional, incomprehensible tests

Examples

- Summerhill School, the oldest democratic school in the world
<http://www.summerhillschool.co.uk>
- Sands School, Great Britain
<http://www.sands-school.co.uk>
- Sudbury Valley School, Massachusetts USA
<http://www.sudburyvalley.org>
- Politeia, a democratic school in Brasil
<http://escolapoliteia.com.br>
- Lumiar – a school with a democratic vision <http://lumiar.org.br>
- Trampolina school, Poznań, Poland
<http://www.trampolina.szkoła.pl>
- EUDEC (European Democratic Education Community) <http://www.eudec.org/>

SCHOOLS FOR GIFTED AND TALENTED STUDENTS

> No standard solutions! <

Ironically, the standard approach to students that prevails in most education systems in the world is not adapted to the majority of students. Teachers often complain about bad students who fall behind and lose all the enthusiasm and motivation to learn (which means they often make trouble in the classroom) and the fact that good students are bored. It's in the interest of the state to have adequate intellectual force that will take on the challenges of contemporary civilisation, make scientific discoveries and improve the efficiency of particular processes. Thus, many countries have recognised the need to find talented students at an early stage of education and provide them with appropriate tools and support for development – the tools and support that they don't receive at traditional schools.

Extra-curricular programmes and programmes are developed that replace the standard curriculum once or a few times a week, as well as schools offering special curriculums adjusted to the individual needs of gifted students. Standard solutions would simply not work in such schools.

Advantages

- Improving the efficiency of the learning process. This approach should be diffused in the entire system
- It's often the only chance for fulfilling the potential of a gifted young person.

Challenges:

- As a result of talented people being taken away from standard schools, the remaining students have no one around to learn from or get inspired from. Gifted students are in a way abstracted from the society and inserted into an artificial environment that does not give the opportunity to, for example, help those in trouble, be an inspiration or a teacher for someone etc. Such an environment often prevents them from understanding the relations that govern the society

Examples

- Quest Academy
<http://www.questacademy.org>
- Magnet Schools
http://en.wikipedia.org/wiki/Magnet_school
- Salzmannschule
<http://www.salzmannschule.de/start/index2.htm>
- Talent Association
<http://talent.edu.pl>
- List of gifted education programmes in the world
http://en.wikipedia.org/wiki/List_of_gifted_and_talented_programmes
- Summer programmes for gifted children
http://www.nwgca.org/uploads/1/2/0/1/12018395/summer_opportunities_2014_from_nwgca.pdf

HOMESCHOOLING AND UNSCHOOLING

› Let's learn outside of schools! ‹

The author of the term unschooling, John Holt, encouraged parents to follow their child, their interests and natural need to learn. The approach is closely connected with the idea of an individual treatment of each child, their skills, learning styles, multiple intelligences and cognitive curiosity, as well as the willingness to eliminate unnecessary stress that accompanies the traditional learning process.

Homeschooling is often considered to be one of the forms of unschooling. But in fact it's not always isolated from school. In unschooling there is often a reference to natural learning models that take place on demand, when there is a need or curiosity or desire to know something. Learning unfolds in every place and at all times and parents are those who model the skills, inspire and ensure adequate surroundings.

Putting aside the name, homeschooling is not limited to learning at home. The education of the child is entrusted to its parents, group of parents (who swap during the week) or a tutor. The education often includes organised entities or communities that give students the chance to interact with other children and verify the progress they make.

Homeschooling enables an individual approach to religion and moral values. It is sometimes the answer to the problem of a child's individual needs that result from their health and an attempt to protect the child from bullying. For many years, it was assumed that homeschooling hindered the development of interpersonal skills in children and the education level was lower than average. Studies seem to demonstrate that the effects are varied and homeschooled children seem happier and more engaged in social life (see e.g. the study of John Taylor <http://www.hslda.org>).

The diversity of methods, attitudes and materials used is immense. In many cases, the education takes place outside the home: in a museum, theatre, at a park, exhibition etc. The curriculum is adjusted to the student's interests and talents, but sometimes parents try to realize their own ambitions or unfulfilled dreams.

In the USA, there are ready-made homeschooling sets available that contain indispensable books, extra materials and tests with answer keys and a teacher's book. They are quite expensive but enable parents to save time on preparations and make the possible return to a traditional school quite easy, as their content is similar to the curriculum at public schools.

Advantages

- Individual approach set in a friendly and familiar environment
- Chance to pursue the child's passions and follow their interests

Challenges:

- Less social interactions, child's separation from participation in school life
- Lack of experience and preparation of the teaching person, lack of established goals and an inability to adjust the approach to the individual needs of the child
- Impossibility of seamless return to the school environment

Examples

- Home education in the United Kingdom
<https://www.gov.uk/home-education>
<http://www.home-education.org.uk>
- Homeschoolers in India
<http://homeschoolers.in>
- Correspondence School in New Zealand
<http://www.correspondence.school.nz>
- Washington Homeschool Organization
<http://www.washhomeschool.org>
- A list of homeschooled people
http://en.wikipedia.org/wiki/List_of_homeschooled_people

HIGHSCOPE

Research and observation give ground to build on

The name refers to an extensive mission and far-reaching goals in the approach towards education of children at the stage of early development, pre-school and elementary school – education that ensures the highest development standard. The origins of the approach can be traced back to the research conducted by David Weikart whose aim was to help high-risk children complete school and find their place in society. Weikart's team worked under the name of Perry Preschool Project. The results showed that providing the children who live in poverty with high-quality educational programmes contributes to their intellectual and social development, improves their results at school, their financial situation in later life and reduces crime. The research was one of the first attempts to investigate the early development of children and the results enabled the formation of a new approach towards their education that takes into consideration their intellectual growth. Its main assumption is that children should be active in the learning process and that their interests and choices determine the activities undertaken.

Every school day is divided into defined blocks that follow each other and the classroom is divided into interest zones that students can freely move around (they are aware of the choices they have). Children work according to the plan-do-review scheme which enables them to plan the activity, do it and, finally, analyse the results. They work in small or large groups and receive support from adults who actively participate in the games, conversations and closely observe their pupils and their progress. Activities that involve movement, music or storytelling are undertaken in large groups, while specific cognitive experiences are undertaken in small groups.

Every day, teachers carefully observe their students and write down the activities and statements the pupils make. They also assess their competences in language, literacy, and communication, social and emotional development, physical development and health, mathematics, science and technology, social studies and creative arts. The essential element of their development is the ability to solve conflicts. The complete development of students' potential is based on play. This active approach towards the learning process requires appropriate surroundings that satisfy the needs of young people and ensure a sense of control and curiosity. The surroundings have to give the student a chance to succeed, feel compe

tent and believe in themselves.

Advantages

- Over the years, the HighScope approach has been tested and verified both in theory and in practice. However, there are doubts about the small sample and lack of repetition of the study
- HighScope provides young people with support adapted to their needs and the current development stage and reinforces their potential as well as strengths. It puts emphasis on problem-solving, planning and decision-making skills
- HighScope environment is rich in materials that enable sensory development, independent work and decision-making. It enables students to explore, manipulate and transform experiences into knowledge. Teachers verify such knowledge on an ongoing basis and encourage students to take up new activities and broaden their horizons

Challenges:

- Children (especially little ones) often become tired during classes conducted in large groups if they last too long
- The studies and the approach were shaped on the basis of goals prepared for high-risk groups
- Materials constitute an essential element of the programme and each facility (school) might have different ones

Examples

- Sekolah HighScope, Indonesia
<http://www.highscope.or.id>
- Head to Toe Early Learning Centre, Ethiopia
<http://headtoeaddis.com/our-curriculum/>
- HighScope Institute, the United Kingdom
<http://www.ukchildcare.ca/practices/bstart2.shtml>
- HighScope Nursery, the United Kingdom
<http://www.hsnursery.co.uk>
- Kaleidoscoop, the Netherlands
<http://www.nji.nl/Kennis/Projecten/Projecten-Kaleidoscoop>



Aleksandra Wzorek

TIPS & TRICKS

TIPS & TRICKS

How can you incorporate emotions into educational activities aimed at children and teenagers?

- Prepare! Think how many emotions you can name “on the spot”. Write them down. Then, Google, look them up in thesauri and books. Write down as many as you can find. Think about the way you deal with various emotions now and the way you dealt with them as a student. What has changed and why? Answer the questions: “Why is it worth paying attention to emotions while realizing this educational activity? Why is it important for my students? Why is it important for me?”
- Enter into a contract with your students. If you lay down the rules together, your students will be more eager to observe them and play fair. It is particularly important to make the participants feel safe and fully engaged in the classes. Suggestions for drawing up a contract: everyone has to agree to the proposed rule, including the instructor; all participants are bound by the reciprocity rule; having laid down all the rules the participants sign the document
- Create a “cheat sheet” of emotions. It can assume various shapes. The most common are the circles of emotions which are divided into sections. The sections that contain names of synonymous emotions (e.g. from the list mentioned above), have a specific colour and are assigned a particular “face”. It would be nice if each participant had a chance to prepare their own emotions circle as the colours associated with different emotions may be different for each participant. Moving away from standard solutions the participants may create their own “emotional” card games or a board game
- Follow each task performed during workshops, lessons and practical classes with a discussion. Let it be an occasion for your students to speak up and talk about the things about their work (individual or in teams) that they liked and did not like, the emotions they experienced. For some people it is easy to speak about emotions but other people will need more time. Remember that this is the moment when there are no right or wrong answers. If someone speaks about their emotions, everybody should respect that. Point out that the participants should build the “I” message
- Remember to speak about “difficult” and “pleasant emotions” and avoid reference to “positive” and “negative” ones. Anger, regret, disappointment are commonly referred to as negative emotions. But there is nothing wrong about them



VIII. Modern education is open-minded

CASE STUDY

Working with emotions and fulfilling educational goals

Challenge:

During a series of three workshop sessions held under a common name “E2 – Empathy in education” addressed to children and their parents, the other three instructors and I were showing the participants how to talk, cooperate and learn from each other. Incorporating elements of work with emotions into didactics has a direct influence on the effects of education. It can support teaching science subjects, language workshops or mastering hard skills.

Process:

The workshops were scheduled to take place on three Saturdays. The aim of the first meeting with children of 6 to 9 years old was to develop a bond within the group and integrate it. The children and the instructors made a contract and laid down the rules together. This was the moment to talk about emotions and build up vocabulary. Using the tools which had been prepared (“faces”, labels) the children described the way they understood various emotions, enacted them in front of the group and developed simple games involving the use of new words. During the second meeting we focused on sparking up an interest in education, but each task included elements associated with emotions. For example, the children solved mystery riddles which had strong emotional overtones. “How would you feel in such a situation?” – that was a question the children were faced with several times. The third meeting involved an adventure in the world of magicians combined with experiments and awarding the “Ambassador of Emotions” badge.

During the sessions with parents which took place simultaneously, we focused on communication skills and the relations between parents and their children. During the session addressed to both parents and children the families completed the “Map of Emotions”. The aim of the exercise was to enable the family members to get to know each other better – get to know each other’s dreams, interests and needs.

Effects:

To sum up the workshop, those parents who wished to receive it got feedback about themselves and their children. Some parents decided to continue the work by attending individual compensatory psychological classes (“Educoaching” programme for children and parents).

According to the feedback provided by parents a few weeks later, the children were more willing to discuss their emotions, they were able to name them and asked for help when dealing with difficult emotions. Two participants have seen a considerable improvement in dealing with school stress.

Magdalena Saja

KALEJDOSKOP

*a democratic school in Tricity (Poland)
– what do children learn when they have freedom of choice?*

Challenge:

Kalejdoskop was founded to provide children with optimum conditions for development based on the assumption that such development can only take place with a sense of freedom, respect, acceptance and security. To be able to achieve these goals, the founders of the school employed the model of democratic education which is based on the equality of rights of all school community members.

One of the consequences of this formula is the fact that children themselves decide every day which activities they will take up. It could be anything e.g. tree climbing, reading books, solving riddles, playing board games, playing tag in the garden, modelling clay, spending time alone or having hour-long conversations.

Process:

The fundamental requirement to start the initiative was to find a group of people who accept the key project assumptions. These were parents who treated children with respect and who believed in their internal motivation to grow, as well as school employees who were able to follow the children, build an authentic relationship and support them in their personal development in an environment where there's no authority or constraint.

Before the school was opened, its founders worked using the same principles: freedom of choice, mutual respect, acceptance and making decisions through consensus. This is how a detailed concept of Kalejdoskop was shaped during a series of hour-long meetings and two-day family reunions. Thanks to this work ethic the school community – the basis of the operation of democratic schools – began forming even before the 2nd September 2014 when Kalejdoskop officially started its journey.

The intended use and equipment of the school rooms had not been specified beforehand but was left to children and adults so that they could be shaped according to the needs that occur in the course of the school year.

Over the first weeks, the activity that prevailed was learning how to be free among others i.e. the recognition of new surroundings: is it true that nobody is in charge here? (why don't the adults tell me what to do?), am I really allowed to do whatever I want to? (e.g. go up the stairs on the other side of the banister?), where does my freedom end? (if I want to be alone, can I ask everyone else out of the room?), what do I really want?

The adults focused their efforts on providing the children with a sense of security in the course of the adaptation process: they identified conflict situations, described them and helped to identify the needs, they gave names to emotions and provided support in reaching an agreement.

The school rules laid down at that time (by children and adults together through consensus) concerned, above all, safety and order.

As time went by, the adaptation process came to an end and the relationship between the members of the community became closer. The children started to feel their influence on the reality surrounding them and started to use it consciously – both when it comes to decisions made by the entire community (e.g. during weekly school meetings) and individual decisions on everyday activities. The lack of an authoritatively imposed plan makes the diversity of activities so large that it is difficult to describe it. What they all have in common is the fact that in democratic education each activity a child takes up is important and educative for them.

Effects:

Most students at Kalejdoskop are 6 years old – these are children who did not attend conventional schools and did not pick up any habits associated with the traditional education system. They quickly assumed the responsibility for their time. Their reaction to the acceptance by adults was trust – they willingly use the adults' knowledge and skills whenever they need them or when they seem interesting.

Let's have a look at communication skills for instance. In Kalejdoskop the majority of children assumed that the way adults resolve conflicts is useful – and today they are more and more often able to identify the reasons of conflicts and search for solutions in such an efficient way that the adults are not really necessary there. For example, the boys who so far had problems in completing any activity due to disagreements are now able to overcome the difficulties and spend the entire day together.

There are other equally important skills: recognising other people's emotions, paying attention to their needs and limitations, heedful listening, speaking one's mind, negotiating, persuasion... They are all built on the foundation of the community and constitute

elements of a complicated puzzle also known as “teamwork skills”. The satisfaction the children draw from being with others is so big that they are willing to learn strategies that will help them.

The development of these key competences stands next to the development of general knowledge and individual interests. Sometimes children bombard adults with questions or ask for classes covering a given subject. At other times they reach for books and study aids or other children’s knowledge. They sometimes organise games associated with the subject that is interesting for them and get other children involved. They follow various directions and adopt different strategies to find the learning style that suits them best.

“Help me do this on my own”

– “The Island of Imagination” project

Challenge:

“Help me do this on my own” – it’s a sentence that Maria Montessori heard from one of her pupils. She found that it wasn’t just a request of a single student but an unspoken appeal of all children to adults. This short sentence became the motto of her work with children.

In our school, one of the most important activity types is the individual work to which we dedicate a few hours. Its aim is to fully support the child in the development of their potential, independence and reliability and to boost their self-esteem. The classes, to which we refer as “individual work”, are a time separated from the other lessons. They enable multidimensional development of a child in the atmosphere of candour and mutual respect. This includes a series of important aspects that form a programme realized by the children individually.

“The Island of Imagination” project, realized by students over a few months as a part of their individual work, can serve as an example. Its realization requires the information and research skills acquired earlier. The aim of the project is to provide students with freedom in being creative. The teacher oversees the class to ensure that everyone’s work is complex and contains a sufficient amount of information about the island.

Process:

During the “The Island of Imagination” project the students use their knowledge in: mathematics, geography, history, science, as well as their individual skills from everyday life. They also create a three-dimensional model of the island. The final challenge is a public project presentation in front of the classmates.

As it is a long-term project, it requires thorough planning. To this end, a time axis with specific stages of the project is designed. It enables students to monitor their progress.

The following aspects of the island are specified: geographic location, size of the island, climate, flora, animal life, the history of the island, society, infrastructure (road and water

routes), traditional clothing of the inhabitants, government, art, religion, public holidays.

Based on these aspects, the students complete a few assignments which eventually form the entire project. These are among others: various historical descriptions, maps with legend, drawings of buildings, tools, garments (casual and elegant), means of transport, plants etc. These materials are combined into a computer presentation which is then presented to other participants.

Effects:

Maria Montessori provided us with a multidimensional process of educating children with a focus on the development of their unique skills and potential, habits, and the ability of acquiring knowledge. Individual work classes are just one of the methods we use to reach the optimum results in educating children. In such a hospitable environment the children learn to follow each task through to the end, they become brave, confident and independent. They are flexible and can adapt to new situations. They don't fear criticism and often take initiative. They are curious of the world. They learn how to work in teams, resolve conflicts and negotiate. In today's world, the value of these competences cannot be underestimated.



AUTHORS

Young Digital Planet Authors



Przemysław Chyrk Former academic teacher with more than 10 years of experience in teaching adults and young adults. Graduate of the Adam Mickiewicz University of Poznan (Poland) and Université Haute-Bretagne Rennes II (France). The business perspective, gained while working in Young Digital Planet sales department, gives him a unique combination of skills and expertise thanks to which he knows exactly what's necessary to meet the demands of the constantly changing job market. He advocates a close partnership between business and education as the only way of developing innovative economics.



Jolanta Gatecka Education Expert in Young Digital Planet, researcher, writer and public speaker. Passionate about education, child development, brain development and its functioning. An attorney-at-law of education, she studied psychology and sociology. During her stay in the United States she taught in the Montessori School and Spanish Immersion Academy. Involved in Waldorf education, Berlitz method and creating state-of-the-art educational materials. She also worked at Microsoft. Mother of two boys, she loves being involved in their educational development. They experiment a lot together.



Alina Guzik Product manager at Young Digital Planet. The originator of the first edition of the Book of Trends in Education. A teacher, speech therapist and marketing and management specialist. Apart from education, she's interested in psychology, especially the power of human self-awareness. She considers personalisation to be the long-awaited bridge between the world of education and the sense of life satisfaction and psychology of success. She loves running, playing board games and, above all, inventing and creating new educational products.



Piotr Milewski R&D specialist in Young Digital Planet keen on gamification, game theory and neurodidactics. A graduate of the University of Gdańsk with a Master's degree in economics and European integration obtained in 2001, he has always loved playing games. Since then he became an author of a few dozen board games, card games, and most of all, LARPs: live action role playing games. Five times nominated in, and three times winner of the Golden Mask LARP competition – twice in a Best Scenario & Design category which he personally values the most. He often shares his experience during game-related conferences and publications. He sincerely hopes that one day gaming and education will merge into one new, ultimately fruitful being.



Monika Mizerska Product manager at Young Digital Planet, responsible for the creation and development of multimedia educational products. Her portfolio contains a number of innovative products, among others the mobile Comprehensive Curriculum winner of the 2013 Quality International prize. She is a teacher for Polish and English and combines her work on educational products in Young Digital Planet with her passion for teaching – she gives classes in postsecondary schools. She is an advocate of the use of technology and visualization in the educational process. She successfully implements technology in her own teaching work.



Olga Nerc As the director of the marketing department in Young Digital Planet she knows (almost) all about team spirit, cooperation and the power of team work. Promoting equality among the team and using group work are best reflected in her professional work. She is strongly convinced that the more people involved in any action the greater the effect. The initiator of many charity actions in both Young Digital Planet and in the local community; she encourages others to help with enthusiasm and devotion. The team leader of a five-member (plus a cat) family, she works on her collaboration skills and family spirit every day.



Ewa Siekierska An experienced project manager and marketing specialist, always ready for new challenges. Dedicated to providing high quality in every project. A copywriter and a linguistic detective. At YDP for quite a few years consistently full of passion for finding ways to influence modern education. A fan of alternative approaches with a broad perspective as a mother of a 7-year-old at a primary school and a 3-year-old at a Montessori kindergarten. A mindfulness practitioner making use of the space between every action and reaction.



Wojciech Wiśniowski A biotechnologist with an emphasis on "technologist". A tech geek, ready to spend a fortune on the latest devices. A devoted product manager with over 10 years of professional experience in Young Digital Planet discovering the impact and possibilities modern technology offers in the learning and teaching process. He is the co-author of the Young Digital Planet best products: mobile Universal Curriculum, mobile Comprehensive Curriculum, Lower Primary Maths: real game-changers stepping ahead of their times. He is happy to share his passion with others.



Marzena Żylińska An acknowledged expert in methodology and neurodidactics. She promotes the introduction of new educational culture based on conclusions of neurosciences and the creative use of technology in teaching. She co-organized the European projects "School on the Move" and "Awakening School". She has penned multiple articles and didactic materials in which she makes use of the conclusions drawn by brain researchers, and two books: *Between a textbook and the Internet (Między podręcznikiem a internetem)* (Warsaw 2013) and *Neurodidactics. Brain-friendly teaching and learning (Neurodydaktyka. Nauczanie i uczenie się przyjazne mózgowi)* (Toruń 2013). One of the consultants for the Ministry of National Education. She runs her own blog Neurodidactics, i.e. neurons at a school desk (*Neurodydaktyka, czyli neurony w szkolnej ławce*).

Case Study

Authors



Radostaw Bomba A doctor and assistant professor at the Cultural Studies Institute of the Maria Curie-Skłodowska University, media specialist and digital humanist. Interested in media education, game studies, digital culture, theory and practice of visualization of knowledge, new science of networks and educational aspects of digital games. He penned a book entitled *Computer Games in the Perspective of Anthropology of Everyday Life* (Gry komputerowe w perspektywie antropologii codzienności) (Toruń 2014) dedicated to the educational value of computer games. He co-organized two Polish THATCamps (The Humanities and Technology Camp). Deputy editor-in-chief for *Culture and History* (Kultura i Historia) magazine. An editor of websites dedicated to science. He's a member of the Polish Association of Cultural Studies and Polish Association of Game Research, and the author of multiple media projects of educational nature, among others: *Jarocin 85' in Second Life*, *MedialabUMCS*, *Visualisation of art* (Wizualizacja sztuki), *Knowledge and Education* (Wiedza i Edukacja) website.



Agnieszka Bilka An English teacher working in her profession for 15 years. She teaches at the Secondary School Complex no. 10 in Gliwice. She promotes a school that is close to technology according to the PSK (Przynieś Sobie Kompa – Bring Your Computer) model with an open WiFi connection. An ardent advocate of the Challenge Based Learning, education through play with the use of games and gamification. She runs the *GamifikacjaEdu* profile on Facebook. An instructor in the e-teacher component at the digital school in the CEO Active Education (Aktywna Edukacja) programme. She manages a virtual English lab in *Szkoła z klasą 2.0* programme. Member of the *Superbelfrzy RP* teaching community and educational ambassador at Intel. A resident of Facebook with a workplace in the cloud.



Marta Florkiewicz-Borkowska She teaches German and design technology at the State Middle School (gimnazjum) no.3 in Pielgrzymowice. An educational instructor and expert at the Centre for Citizenship Education. She is an educator in the application of high-tech solutions in education and a student of art therapy. A member of the Superbelfrzy RP community. She is a fan of project-based learning, learning through teaching and new technology. She promotes board games. She runs two blogs: <http://deutschfun-pielgrzymowice.blogspot.com/> on German and <http://handmade-pielgrzymowice.blogspot.com/> on design technology.



Alina Idzikowska A certified teacher with 20 years of experience. She teaches music and history at a primary school in Warsaw. She is also active in the artistic field at her school (choir, theatre, music bands). In 2013 she learned programming in Scratch during the Masters of Coding (Mistrzowie Kodowania) programme. She became interested in teaching Maths to be able to help her students. When she noticed that boredom prevents children from learning, she began to search for new innovative methods of teaching the subject. At first she didn't believe it was possible for a teacher of humanities to code, but today she is passionate about programming in Scratch and shares her skills with her students.



Katarzyna Krywult A teacher of Polish and a member of the Superbelfrzy RP community. She is a graduate of the Jagiellonian University in Polish philology and the Pedagogical University in personalized and differentiated education. She currently works at the primary school in Bestwina. An e-learning self-taught, creator and coordinator of multiple school projects, including a filmmaking workshop on stop motion animation and Lip Dub. The founder of the polski.enauczanie.com website and the Polish language manual (Instrukcja obsługi języka polskiego) project, winner of The Best Content For Kids contest.



Anna Miler A graduate of cultural and political studies and a doctoral student of philology at the University of Gdańsk. She is interested in the role of socio-cultural animation and cultural managers in the social changes. In her work she deals with non-formal cultural education and socio-cultural animation. She works at the Gdańsk Archipelago of Culture PROJEKTORNIA (Gdański Archipelag Kultury PROJEKTORNIA) and at the Arteria Association. She cooperates with other institutions and organizations in Poland. Interested in the use of new media in cultural education. She participated in projects such as: Girls draw comics, too (Dziewczyny też rysują komiksy), Films and pixels (Klisze i piksele), Visual Education (Edukacja wizualna) and Action! Comics in motion (Akcja! Komiks w ruchu) (the last two under the Orange Academy), The shipyard is a woman (Stocznia jest kobietą) and many others.



Jolanta Okuniewska A certified teacher with 27 years of experience. She works as a teacher of the youngest children and an English teacher in 1st – 3rd grade at the primary school no. 13 in Olsztyn. An ambassador of the international eTwinning programme in the Warmińsko-Mazurskie province. The winner of the first place in the European contest My eTwinning project in 4-11 age group in 2013 and a two-time laureate of the national contest. She penned an e-book entitled Technology is for children. A guide for early childhood education teachers (Technologie są dla dzieci. Poradnik dla nauczycieli edukacji wczesnoszkolnej). She was awarded the prize of the Chief Education Officer of the Warmińsko-Mazurskie province and the prize of the Minister of National Education. She was nominated as the Best Teacher of 2013 under the patronage of the Ministry of National Education and Głos Nauczycielski magazine. In her work with students she uses tablets. She runs a blog: www.tableciaki.blogspot.com



Marcin Paks A history teacher at the middle school (gimnazjum) no. 8 at the school complex no. 5 in Sosnowiec. A member of the Superbelfrzy RP community. A School Education Development Organizer in Katowice. An educator in the use of ICT in education by teachers. He is an expert of the Centre for Citizenship Education in the Szkoła z klasą 2.0 programme, a blogger and a columnist. The creator of the online simulation method – Drama OnLine. He is passionate about the application of new solutions in education, especially the use of mobile devices.



Piotr Peszko A designer, instructor and creator of online training. He is a blogger and education commentator. He runs his own blog about e-learning: blog.2edu.pl. The founder and organizer of a series of educational barcamps – EduCamp, and courses in e-learning.



Grzegorz D. Stunża A doctor of social studies in pedagogy, he works as an assistant professor at the Media Education Lab at the Institute of Pedagogy of the University of Gdańsk. He is chiefly interested in media education in its broad sense. He tries to combine pedagogical exploration with cultural inspirations (he studied cultural studies at a master's degree programme for one term) and takes on practical activities alongside theory and research. He is fascinated by medialabs and participates in the construction of Gdańsk Medialab at the Municipal Culture Institute in Gdańsk. He sometimes acts as an expert in media education for the National Audiovisual Institute, the Ministry of Culture and National Heritage, Modern Poland Foundation.



Magda Saja A co-founder of the Kalejdoskop Democratic School of Tricity. A member of EUDEC (European Democratic Education Community) and a Polish community working for the benefit of democratic education. She is a graduate of philology fascinated by antipedagogy, the theories and achievements of A.S. Neill, J. Holt, H. von Schöenebeck, I. Illich, D. Greenberg and the contemporary concepts of family psychology.



Beata Szulc A passionate of the Maria Montessori method. Her professional life began in the corporate world, but even at the time she participated in training and courses on the method. In the meantime, she took up a post-graduate course in Early Childhood and Preschool Education. In 2011 alongside other enthusiasts she founded a Christian Montessori Education Foundation called CHCEMY which, the same year, started the first primary school in Tricity that worked according to the Montessori method. Since 2013 she has been the head teacher at the Christian Montessori School in Gdańsk. She gives numerous lectures and runs workshops on the method. She cooperates with the Polish Montessori Institute in Warsaw. She is married to Maciej and they have three children – Piotr, Ola and Jaś.



Joanna Waszkowska She has been teaching Polish for 12 years in various schools. Currently, she works at the complex of private schools Twoja Przyszłość in Sosnowiec. She teaches middle school (gimnazjum) and primary school students. She is happy to use new technology in her work to make education more efficient. A member of the Superbelfrzy RP community. She runs her own blog on teaching www.uczcielnica.blogspot.com.



Aleksandra Wzorek A lawyer, educator and instructor in Educational coaching (Coaching edukacyjny) compensatory and psychological classes for children and teenagers. A coordinator on the basis of content and an author of a textbook for teachers under the POKL (Operational Programme Human Capital) project Playing Classes – development without boundaries (Gra w klasy: rozwój bez granic) (www.grawklasy.edu.pl). She is the co-author of a textbook Don't be afraid of blogs. The use of blogs in education ((Nie)bój się bloga! Jak wykorzystywać blog w edukacji) created under the Medialab project – education and culture lab. She is the co-creator of the winning project at the Startup Sprint Edukacja. She held a series of workshops for teachers, children and parents on the perception of emotions in the education process E2 – Empathy in Education (Empatia w Edukacji). She is also a tutor who uses innovative teaching methods in subjects and therapy.

Who is Young Digital Planet?

Young Digital Planet is a group of professional hotheads working every day on solutions which improve and enrich the world of modern education. A team of fresh thinkers who use the most effective methodologies and the latest technologies – all in order to provide ways to boost everyone’s potential. We want to inspire students, teachers, parents and make education an effective, friendly and joyful process.

We have over 20 years’ experience in delivering digital solutions that support the educational institutes all over the world. Our solutions have been implemented in more than 45 countries. We are a reliable partner, ready to forge strong relationships based on mutual trust and support over years of successful cooperation.

We cover all dimensions of education:

- Education content – covering different subjects, curricula and language courses
- Delivery platforms and publishing technologies – flexible solutions for everyday use
- Products that support children and adults with special educational needs

In our belief, the modern idea of education focuses on individual needs. The personalised approach makes the learning and teaching process effective and interesting, since self-motivation is the best way to achieve true engagement. This approach can be realized through carefully and precisely designed digital solutions – content and tools, and we know how to successfully employ technology in education.

We deliver digital educational products and technologies as well as the support and consultancy in the transformation journey from print to digital. We provide a complete set of solutions and services dedicated to supporting digitalisation. The transformation that we offer is based on in-depth understanding of educational trends and the needs of all the actors in the educational process.

Modern education inspires young people to seek unconventional solutions and creative ways of dealing with problems. Only in this way will they be well-prepared for the challenges of adult life. We are here to help them.



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