Education and Culture
Lifelong learning programme
COMENIUS

KeyTTT

Teamwork, Training and Technology
for development of Key Competences Project

# The KeyTTT Methodology Basis

## KeyTTT Teaching strategies

# 1. Key Competencies for Lifelong Learning

In December 2006, The European Parliament and Council recommended eight Key Competencies for Lifelong Learning. They defined key competencies as "a combination of knowledge, skills and attitudes...which all individuals need for personal fulfillment and development, active citizenship, social inclusion and employment." Skills and attitudes, including critical thinking, creativity, initiative, problem-solving, risk assessment, decision-taking, and constructive management of feelings are also made explicit within many of the competencies.

These key competences are:

- communication in the mother tongue which is the ability to express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing), and to interact linguistically in an appropriate and creative way in a full range of societal and cultural contexts;

- communication in foreign languages which involves, in addition to the main skill dimensions of communication in the mother tongue, mediation and intercultural understanding. The level of proficiency depends on several factors and the capacity for listening, speaking, reading and writing;

- mathematical competence and basic competences in science and technology. Mathematical competence is the ability to develop and apply mathematical thinking in order to solve a range of problems in everyday situations, with the emphasis being placed on process, activity and knowledge. Basic competences in science and technology refer to the mastery, use and application of knowledge and methodologies which explain the natural world. These involve an understanding of the changes caused by human activity and the responsibility of each individual as a citizen;

- digital competence involves the confident and critical use of information society technology (IST) and thus basic skills in information and communication technology (ICT);

- learning to learn is related to learning, the ability to pursue and organise one's own learning, either individually or in groups, in accordance with one's own needs, and awareness of methods and opportunities;

- social and civic competences. Social competence refers to personal, interpersonal and intercultural competence and all forms of behaviour that equip individuals to participate in an effective and constructive way in social and working life. It is linked to personal and social well-being. An understanding of codes of conduct and customs in the different environments in which individuals operate is essential. Civic competence, and particularly knowledge of social and political concepts and structures (democracy, justice, equality, citizenship and civil

rights) equips individuals to engage in active and democratic participation;

- sense of initiative and entrepreneurship is the ability to turn ideas into action. It involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. The individual is aware of the context of their work and is able to seize opportunities which arise. It is the foundation for acquiring more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance;

- cultural awareness and expression which involves appreciation of the importance of the creative expression of ideas, experiences and emotions in a range of media (music, performing arts, literature, and the visual arts).

## 2. Constructivist Learning Models for Development of Key Competencies for Lifelong Learning

### 2.1. Constructivism

Constructivism is a perspective of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in.; i.e. knowledge is not passively received but actively **constructed** by the person who learns. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences.

There are several guiding principles of constructivism:

- Learning is a search for meaning. The construction of knowledge happens in the interaction between the new information and the previous experience. Therefore learning must start with the issues around which students are actively trying to construct meaning.

- The construction of knowledge takes place in a social, linguistic and cultural context.

- Meaning requires understanding the whole as well as parts. And parts must be understood in the context of whole. Therefore, the learning process focuses on primary concepts, not on isolated facts.

- In order to teach well, we must understand the mental models that students use to perceive the world and the assumptions they make to support those models.

- The purpose of learning is for an individual to construct his or her own meaning, not just memorize the "right" answers and regurgitate someone else's meaning. Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring it provides students with information on the quality of their learning.

How Constructivism impacts learning:

- Curriculum: Constructivism calls for the elimination of a standardized curriculum. Instead, it promotes using curricula customized to the students' prior knowledge. Also, it emphasizes hands-on problem solving.

- Instruction: Under the theory of constructivism, educators focus on making connections between facts and fostering new understanding in students. Instructors tailor their teaching strategies to student responses and encourage students to analyze, interpret, and predict information. Teachers also rely heavily on open-ended questions and promote extensive dialogue among students.

- Assessment: Constructivism calls for the elimination of grades and standardized testing. Instead, assessment becomes part of the learning process so that students play a larger role in judging their own progress.

Discovery based constructivism is an interactive and hands-on way of learning. It creates self reflection, situated cognition, it fosters self discovery, and it is a way of practicing skills directly, and a part of real world learning.

Overall, the effects of unassisted discovery tasks seems limited, whereas enhanced discovery tasks requiring learners to be actively engaged and constructive seem optimal. The effects and learning outcome by use of constructivism workshops is based on the fact that optimal approaches should include:
- Guided tasks that have scaffolding in place to assist learners, or
- Tasks requiring learners to explain their own ideas and ensuring that these ideas are accurate by providing timely feedback, or
- Tasks that provide worked examples of how to succeed in the task.

Constructivism develops best practices and includes process, not product, - and includes predicting, observing, explaining, - and includes conceptual changing, - and includes constructivist instructional model, - and includes scaffolding. It also allows a lot of different ways of collaboration; as group work, cooperative learning, active processes, constructing knowledge, external through processes.

Constructivism develops a variety of teaching strategies, and leads to project based-, problem based-, product based-, and case based strategies.

## 2.2. Problem-Based Learning (PBL)

Problem-Based Learning (PBL) is an instructional method of hands-on, active learning centered on the investigation and resolution of messy, real-world problems.

Key Terms: open-ended problems, self-directed learners, teacher as facilitator, student as problem solver

The following are some of the defining characteristics of PBL:
- Learning is driven by challenging, open-ended problems with no one "right" answer.
- Problems/cases are context specific.
- Students work as self-directed, active investigators and problem-solvers in small collaborative groups (typically of about five students).
- A key problem is identified and a solution is agreed upon and implemented.
- Teachers adopt the role as facilitators of learning, guiding the learning process and promoting an environment of inquiry.

Rather than having a teacher provide facts and then testing students ability to recall these facts via memorization, PBL attempts to get students to apply knowledge to new situations. Students are faced with contextualized, ill-structured problems and are asked to investigate and discover meaningful solutions.

Proponents of PBL believe that, as a strategy, it:
- develops critical thinking and creative skills;
- improves problem-solving skills;
- increases motivation;
- helps students learn to transfer knowledge to new situations.


## 2.3. Project Based Learning

Project Based Learning is an instructional approach built upon authentic learning activities that engage student interest and motivation. These activities are designed to answer a question or solve a problem and generally reflect the types of learning and work people do in the everyday world outside the classroom.

Project Based Learning is synonymous with learning in depth. A well-designed project provokes students to encounter (and struggle with) the central concepts and principles of a discipline.

Project Based Learning teaches students 21st century skills as well as content. These skills include communication and presentation skills, organization and time management skills, research and inquiry skills, self-assessment and reflection skills, and group participation and leadership skills.

Project Based Learning is generally done by groups of students working together toward a common goal. Performance is assessed on an individual basis, and takes into account the quality of the product produced, the depth of content understanding demonstrated, and the contributions made to the ongoing process of project realization.

Finally, Project Based Learning allows students to reflect upon their own ideas and opinions, exercise voice and choice, and make decisions that affect project outcomes and the learning process in general.

Combining these considerations, we define Project Based Learning as a systematic teaching method that engages students in learning essential knowledge and life-enhancing skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and tasks.

## 2.4. Experiential Learning (Kolb)

Kolb's *experiential learning theory* is a holistic perspective that combines *experience, perception, cognition,* and *behaviour*.

David A. Kolb believes learning is the process whereby knowledge is created through the transformation of experience. The theory presents a cyclical model of learning, consisting of four stages shown below. One may begin at any stage, but must follow each other in the sequence:
- concrete experience (or "DO")
- reflective observation (or "OBSERVE")
- abstract conceptualization (or "THINK")
- active experimentation (or "PLAN")

Kolb's four-stage learning cycle shows how experience is translated through reflection into concepts, which in turn are used as guides for active experimentation and the choice of new experiences. The first stage, concrete experience (CE), is where the learner actively experiences an activity such as a lab session or field work. The second stage, *reflective observation* (RO), is when the learner consciously reflects back on that experience. The third stage, abstract conceptualization (AC), is where the learner attempts to conceptualize a theory or model of what is observed. The fourth stage, active experimentation (AE), is where the learner is trying to plan how to test a model or theory or plan for a forthcoming experience.

Kolb identified four learning styles which correspond to these stages. The styles highlight conditions under which learners learn better. These styles are:
- assimilators, who learn better when presented with sound logical theories to consider;
- convergers, who learn better when provided with practical applications of concepts and theories;

- accommodators, who learn better when provided with "hands-on" experiences;
- divergers, who learn better when allowed to observe and collect a wide range of information.

## 2.5. Multiple Intelligences Theory

Multiple Intelligences Theory posits that there are seven ways people understand in the world, described by Harvard psychologist Howard Gardner as seven *intelligences*.

This theory states there are at least seven ways ("intelligences") that people understand and perceive the world. These intelligences may not be exhaustive. Gardner lists the following:

- Linguistic. The ability to use spoken or written words.

- Logical-Mathematical. Inductive and deductive thinking and reasoning abilities, logic, as well as the use of numbers and abstract pattern recognition.

- Visual-Spatial. The ability to mentally visualize objects and spatial dimensions.

- Body-Kinesthetic. The wisdom of the body and the ability to control physical motion

- Musical-Rhythmic. The ability to master music as well as rhythms, tones and beats.

- Interpersonal. The ability to communicate effectively with other people and to be able to develop relationships.

- Intrapersonal. The ability to understand one's own emotions, motivations, inner states of being, and self-reflection.

Implications for Classrooms. The verbal-linguistic and logical-mathematical intelligences are the ones most frequently used in traditional school curricula. A more balanced curriculum that incorporates the arts, self-awareness, communication, and physical education may be useful in order to leverage the intelligences that some students may have.

## 2.6. Learning by Doing

Learning by doing is essentially about getting involved in an activity and, through the process of doing this activity, learning about things like:
- how that activity works,
- how you find (or feel about) the activity,
- what the activity makes you think about, and
- what doing this activity enables you to do.

The learner might also be prompted to think about the general nature of the activity - in other words, the way this activity is done by other people,

in different contexts. Put together, this learning can serve to strengthen the own understanding of the activity through gaining practical, first-hand experience of the activity. It can also be a stimulating, motivating way for people to learn - in fact, people can often be having so much fun in taking part in the activity, that they can learn whilst being unaware that they are learning! While this may be desirable for some types of projects, where participation is the key, it may also cause problems in the sense that the learning gained from a specific task is diffuse and unrelated to other aspects of the learner's experience, worldview, and field-of-study.

In other words, learning by doing is something that the learner should ideally reflect on during and after the activity to get most out of it - but it can also be an extremely natural way of learning (it is sometimes referred to as "incidental learning"), which can be undertaken - consciously or unconsciously - by anyone at any time.

## 2.7. Co-operative learning

Co-operative learning is a structured form of group learning. It is particularly useful as a framework for team project work. It ensures individual learners understand that their contribution is vital to the team.

A fully developed co-operative learning approach contains these five elements:
- positive interdependence – 'we sink or swim together';
- individual and group accountability;
- face-to-face interaction or its electronic equivalent;
- explicit learning of interpersonal and team work skills;
- group processing – to evaluate team functioning and agree which behaviors to change.

The use of co-operative learning has been extensively studied. It has been found to improve information acquisition, higher-level thinking skills, interpersonal and communication skills. It can also encourage active citizenship and promote equality and diversity, for instance, by breaking down barriers between learners.

# KeyTTT Teaching strategies

## Interactive web-conferencing sessions in teaching sciences

### Short introduction:

In the learning process there are milestones and ways to reach them. It is beyond the reach of this text to examine how interactive whiteboards (IWB) and videoconferencing sessions improve the learning process in general, but we will focus on how this teaching approach can significantly improve the *understanding pattern* of a group of learners.

The major benefit of using the IWBs in a videoconferencing (network) mode is the huge amount of knowledge transmitted in compressed time format and the complex character of the knowledge which students receive. This is possible due to the highly emotional and highly interactive environment that connects real people discussing on real objects or problems.

The interactive whiteboards are an IT tool that contributes significantly to innovate the classroom. IWB surface through which students can view and interact with images, text, animation, video and specialised educational software, helps to transform the classroom in an environment attained by many media and provide access to the universe of information and communication technologies (ICT).

The use of interactive whiteboards brings a lot of interaction in the learning process; because of the improved dynamics of the lesson/session it also improves attention and the group control.

However, the focus of this *teaching strategy* is not the mere suggestion to use another piece of expensive equipment in the classroom work, but the networking functions of this equipment which allow connection of two remote classrooms or a real-time communication between a classroom and a scientist, lecturer or a lab, situated in different city or even country.

### The motivation

One of the most significant challenges to the classroom-based learning process, or even generally to the face-to-face learning process **is its abstraction**. The examples are flat, usually emotionless, if there is

emotion it is simulated or overplayed, or provoked by force. It is well known that emotion is one of the strongest learning tools and is most wanted in any learning process. The interactive whiteboards and their networking capabilities (which, however, vary from manufacturer to manufacturer) can introduce whole new horizon of methods for invoking emotion in the training session.

Some facts:
- Learners prefer real objects to be their study-objects */Picture of real bear is preferred than illustrated bear/*
- Learners prefer real situations to be their study-situations */real scene or movie scene is preferred than sketch in the textbook/*
- Learners prefer to have control over the object/situation, that increases the self-esteem and self-confidence, crucial to the learning process
- Learners not physically present in the classroom can be reached and trained
- Interactive whiteboard can be mastered by a trainer in 20 hours of training and 10 hours of individual practice
- The network capability of interactive whiteboards is especially effective when used with new or unknown topic; the first-step results as knowledge to the learners are stunning!
- With an IWB session complex and interlinked knowledge is introduced, for example in same session learners can be taught in engineering and in German or in climate changes and in digital competences.

**The work plot:**

**1. Teachers prep-meeting:** teachers (tutors) have to exchange information in advance by email or web-conference (f.i. Skype connection) to agree on the topic, aims and main contents of the lesson. This exchange may require several interactions.

**2**. **School calendar**: it is very important all activities to be done in well planned consequence to prevent mistakes. An interactive web-conference can be divided in general in three stages: activities to be done **before** the web-conference, the **web-conference** itself, activities to be done **after** the interactive lesson.

**3. Exchange information about students**: exchanging information about the students is useful, because it would allow remote pairing of pupils or making virtual teams or tailoring the knowledge to the skills of the learners (in case of web-conference with a lab or a scientist).

**4. Tools** (for each side of the interactive connection):
- a computer

- an internet connection
- a software to connect the partners (f.i. oOvoo, Skype, VZO as open source software, or PVX Polycom and Adobe Bridge...)
- an IWB and multimedia projector
- a webcam
- speakers suitable for the whole study-room (or headphones)
- a camcorder and/or a camera to document the lesson
- microphone (optional)

**5. Test videoconference**: to avoid mistakes it is better to test the connection between partners before the date fixed for interactive session. The test should involve the technical equipment and the materials to be uploaded as a lesson track

**6. Starting web/videoconference**
- connect camera and IWB to the computer
- open connection software
- invite the partner to web-conference by using IWB software (Note: if there is no available camera, it could be enough to work with IWB video-capture function, to make a record of the videoconference)

**7. Web/videoconference**
- teachers/ tutors introduce themselves
- students introduce themselves to make them feel involved in activities (just telling the names might be sufficient if the time is limmited)
- one of partners starts the activity (or introduces the topic) interacting with the other partner by using slides or pictures imported on the IWB stage
- teachers should plan and ask questions to students to be sure they are always involved in the lesson
- students should receive some written tasks to allow them to check all their ork and the activities to be done.

**9. Revision & Documentation:** a follow-up revision after the end of the web-conference is an important part of the work. It gives students opportunity to reflect on the activities they have done/ experienced and allows teachers to explain points of strength or weaknesses.

**The challenges**

Using interactive whiteboard to represent a certain topic is a challenge to the teacher to a greater extent than to the students. It requires investing significant quantity of time for planning and preparation, and demands some skills from the teacher who has to have at least moderate *digital competences,* among which general ability to operate with computer and peripheral equipment and basic knowledge of the functions of the IWB.

Nevertheless, a networking videoconference session is among those teaching formats when teachers do not have to be better than their pupils in the ICT, as they can rely on the pupils' competences and even to

request their support. Alongside with many other features this can help a lesson with an IWB to be perceived by the learners as a **game** which may bring along positive emotions, in spite of the fact that the *game-based learning*[1] has its own clues and should be approached carefully.

## Conclusion

It is important to acknowledge that each student learns in different way. Implementing a variety of teaching styles throughout the teaching course allows the students the chance to learn in at least one way that matches their learning style. In the constructivist model, the students are urged to be actively involved in their own process of learning. The teacher functions more as a facilitator who coaches, mediates, prompts, and helps students develop and assess their understanding, and thereby their learning. One of the teacher`s biggest jobs becomes asking the good questions.

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[1] More readings on game-based learning: http://web.mit.edu/ or http://en.wikipedia.org/wiki/Game_based_learning or http://www.eun.org/web/guest/home

# Discovery based constructivism

## 1.    Method

Discovery-Based instruction with constructivist concept of exploration, discovery, and invention. **The target information must be discovered by the pupils within the confines of the task and its material.**

Experimenting is a constructivist way of learning, instead of passively try to understand the nature of physical laws, students have to creatively experiment in order to make it work. The school has traditionally focused on the logical mathematical and linguistic intelligences. Science teaching (as with water rockets for example) is in many ways consistent with Howard Gardner`s learning philosophy since it adds up with a variety of experiences; creativity, initiative, problem-solving investigation, risk assessment, decision-taking and constructive management. Learning by doing can transform actions in knowledge, knowledge into competence, competence into skills.

It combines many basic learning strategies that will improve the learning outcome. Abstract concepts as in many physical theoretical laws becomes concrete concepts for pupils to manage. Learning by doing promotes interest in practical learning of science subjects, using problem solving methodology.



*Staging water rockets – is an example of a constructivist way of learning.*
*For details – see the KeyTTT activities.*

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Constructivism develops best practices and includes process, not product, - and includes predicting, observing, explaining, - and includes conceptual changing, - and includes constructivist instructional model, - and includes scaffolding. It also allows a lot of different ways of collaboration; as group work, cooperative learning, active processes, constructing knowledge, external through processes.

The discovery-based constructivism also coincides with the key competences, and supports developing of critical thinking, creativity, initiative, problem-solving, risk assessment, decision-taking, and constructive management.

## 2.    Key competences

| Competence | Knowledge | Skill | Attitude |
|---|---|---|---|
| **Communication in mother tongue** | Basic vocabulary | Communication | Critical and constructive dialogue |
| **Communication in foreign language** | Verbal interaction | Understand spoken messages | Curiosity in language and intercultural communication |
| **Mathematic, science and technology** | Basic mathematical understanding. Fundamental scientific concepts. | Communication in mathematical language. Ability to use technological tools. | Respect of truth. Critical appreciation and curiosity. |
| **Digital competence** | Main computer application, be able to use IST to support creativity and innovation. | The ability to search, collect and process information. | Critical and reflective attitude towards available information |
| **Learning to learn** | Understand their preferred learning strategies. | Literacy, numeracy and ICT that are necessary for further learning | Motivation and confidence to pursue and succeed at learning. |
| **Interpersonal, intercultural, social and civic** | Understanding the codes of conduct and manners generally. | Feel empathy. Understand different viewpoints. | Collaboration, assertiveness and integrity. |

| Competence | Knowledge | Skill | Attitude |
|---|---|---|---|
| **Entrepreneurship** | Broad understanding of available opportunities. | Proactive project management Assess and take risks. | Initiative, independence and innovation. |
| **Cultural expression** | Major cultural work, popular contemporary culture. | Appreciation and expression. Ability to relate creative and expressive points of view. | Creativity. Artistic self-expression and interest in cultural life. |

Many of the competences overlap and interlock, by they all promote the combination of knowledge, skills and attitude appropriate to the context.

## 3. Conclusion

The challenge in teaching by discovery-based constructivism seem to be how to provide feedback in classroom settings, how to create working examples for varieties of content, and how to provide direct forms of instruction during the learning task. It is important to acknowledge that each student does not learn in the same way. By implementing a variety of learning styles throughout the course allows the students the chance to learn in at least one way that matches their learning style. In the constructivist model, the students are urged to be actively involved in their own process of learning. The teacher functions more as a facilitator who coaches, mediates, prompts, and helps students develop and assess their understanding, and thereby their learning. One of the teacher`s biggest jobs becomes asking the good questions.

# Dalton Plan

Dalton Plan - originally called Dalton Laboratory Plan was created by an American educator Helen Parkhurst, who worked with students at different levels and had to individualize the work of each of them.

The main objective of the Dalton Plan is to develop in pupils responsibility for given tasks and to give them freedom of individual work. To achieve these, it breaks up with the traditional classroom teaching method and is based mainly on **individual work** and **independent tasks** tailored to students' skills.

Teacher becomes an adviser, an expert in certain areas, an assistant and helps students to outline their work. He/she prepares students' monthly and weekly charts – the so-called allocations according to which individual students are managing their own working time. In the monthly or weekly worksheets the teacher describes in detail the type of tasks and the way of their implementation, determines the sources which the students can use, topics, fields of science relating to specific exercises.

Students take active role in planning their own work, stating the time they will spend and determining the exact days for tasks completion. In doing this they are assisted and supported by their teacher who helps students to outline their work. For this purpose there is possibility of convening a classroom conference, which can be attended by one or many students.

According to the Dalton Plan the teacher is able to individualize the students' work and to adapt to the needs and capabilities of each of them – he/she gives the pupils the task which is not too easy and not too difficult so as to motivate them to continue working and learning instead of overwhelming them with the amount of material.

Working according to the Dalton Plan allows each student to achieve success and climb the educational ladder at his own pace. The teacher becomes a sort of a signpost indicating different actions.

The aim of Helen Pankhurst's educational model was to achieve balance between each child's talents and the needs of society. The author focused particularly on:
• customizing the program to the needs, interests and abilities of individual students,
• promoting both self-reliance and confidence in others,
• improving a student's interpersonal skills and a sense of responsibility in relation to others.

The **three main principles** on which Helen Pankhurst based the Dalton plan:
• learning how to use the self-reliance skilfully,
• learning how to work individually,
• learning how to cooperate.

Instead of "self-reliance" the term "responsibility" is used in the Dalton school, which better reflects the pedagogical goal. It gives students the space necessary for the development. Of course, the scope of it may vary in case of an individual child just like the needs and abilities of each child.

These principles match the overall objective of the Framework of the Key Competences for LLL and turned the attention of the KeyTTT project implementers in Poland who suggested the Dalton plan for consideration for the integrated project methodology.

### Self-reliance / responsibility

Borderlines are necessary because younger children need more support than older ones. There are differences in the way students cope with autonomy and teachers need to remember that. One may wonder if this system doesn't make life too easy for children, but in reality it aims to teach a good usage of self-reliance and responsibility.

When autonomy becomes too difficult for the child, the teacher's task is to help him. Self-reliance (self motivation), in relation to the principle of autonomy, must support the learning process. It is commonly known that everything we learn through our own experience will be better remembered than the information received from others, including the teacher. Many cases of initiative shown by the children are "wasted" because of the educators' instructions uttered too often.

### Working individually

Willingness to take responsibility and initiative is a natural need of the child and can be seen among different age groups of children (from youngest to oldest.) It is linked to their age and their level of intellectual development.

In Dalton school it is used in a planned manner. Children are responsible for the tasks and commands that they perform, teaching aids that they use, the order in the classroom, and for other children. In short, they take direct responsibility for many daily events at school. The school class rooms are equipped so as to allow teachers for this way of working with students.

Planning and completion of tasks by children in the light of certain clearly defined principles, encourages them even more to take responsibility.

### Cooperation as a pedagogical principle

The interaction between students is an important element of Dalton education. Research and practice show that the explanations received from peers, sometimes give a better result than the instructions received from the teacher because the child gets a message at his level and in a

language he understands. Dalton system does not assume, however, that a child is only a helper for the other students.

Cooperation as a principle of teaching may be present in almost every game and during the studying time. Interaction (for example in pairs) not only enhances the effect of teaching, but also the relationship between the children.

While introducing Dalton plan in each classroom and in every school would be impossible due to the characteristics of the educational curriculum and the centralized manner of management of the educational system, many features of this method can be used by the teachers in organizing their class-work in certain subjects, giving more autonomy to the students to organize their work log and to produce and present learning outcomes which can be reported to the class or to the teacher (depending from the nature of the tasks).