



TEACH-project

**Translating and implementing Evidence based theory and
Assessment into the Classroom practice
to Heighten education for all**

An Erasmus+ KA2 project (2014-1-BE02-KA201-000477)

www.teachproject.eu

INTELLECTUAL OUTPUT 4: GUIDELINES

Leading Organization: TOPunt Gent

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1. INTRODUCTION

The TEACH-project (Translating and implementing Evidence based theory and Assessment into the Classroom practice to Heighten education for all) is a strategic partnership between 4 European organizations: TOPunt Gent (pupil guidance centre), the Universidad de Granada (Faculty of Psychology), Tallinna Haridusamet (department for education Tallinn) and Skolförvaltningen Mölndal (department for childwelfare and education Mölndal).

The TEACH-project wants to make a bridge between theory and practice, between knowledge organisations and the educational field. There is a lot of research on what works to improve the learning of pupils and improve assessment but we need more active knowledge transfer from theory to practice. Through this project we implemented evidence based, effective and inclusive approaches in the different classroom practices and their support systems. We focused on translating theory and research into good practices and relevant recommendations to improve the quality of the education for all pupils at school and to have a bigger impact on learning.

How can we become more effective in teaching children with special educational needs? When we want to maximize our impact on learning, we need to know the strategies that work best to improve learning. The TEACH-project processed evidence based research on what works best to enhance children's learning abilities and improve assessment methods. We wanted to bring scientific knowledge into practice and elected topics to implement in the classroom.

Based on the findings of John Hattie (New Zealand), David Mitchell (New Zealand) and Geoff Petty (UK) and others we explore what has a big impact on learning. What are evidence based teaching strategies to implement in the classroom? How do children learn and how do we make it visible? We explore what effective feedback means and how to apply it in practice. Furthermore, we elaborate on how we can use formative or dynamic assessment to map the learning potential. How can assessment contribute to enhancing the learning performance?

Each partner organisation has incorporated these topics in a teachercourse or experimental group. In these courses/groups we experimented and shared good practices with evidence based education with school teams and their support system.

2. WHAT HAS A BIG IMPACT ON LEARNING? WHAT ARE EVIDENCE BASED TEACHING STRATEGIES?

2.1 What is evidence-based teaching?

All children, specifically those children with special educational needs, benefit from effective evidence based teaching strategies. Research evidence can help professionals to become more effective in teaching and understanding the learning process.

In order to improve the learning of children, we need to know and understand which strategies could have a big impact on learning. Schools and teachers have to ask themselves: which strategies are the most productive and what is my impact on the learning of the pupils? It is not our goal that teachers master all the methods shown to be effective. An important directive is the 20-80 rule: 20 per cent of what you do makes 80 per cent of the difference. So let's work smarter, not harder, by concentrating on the factors that make this difference. (Petty, 2009, p.3)

2.2 Principles of evidence based practice

The evidence based practice leans on some foundations or principles. You need to take them all into account if you want to speak about evidence based education.

You first have to consider all the evidence to make a profound decision. If you want to evaluate an educational strategy in order to use them in the classroom, you need to compare it with alternative options and strategies. That way you can see the effectiveness of a strategy. This effectiveness is expressed in an "effect size". The good news is, that this comparison is already made by experts like Hattie or Marzano.

Secondly, it's not enough to know what works but also why it works. Because if we don't understand why something is working, we do not use it effectively. What makes it work?

Further, you need to consider the critical success factors that are needed in your teaching context. Every school, every teacher, every group of students is different. That implies that you have to translate the strategies into your own teaching and school context.

Finally you consistently need to adjust your teaching method by using the feedback that you get from your students.

2.3 The most effective teaching strategies

Hattie (2012) analysed over 500,000 effect sizes from over 300,000 studies and extracted a range of strategies and expressed the effectiveness of these teaching methods and strategies in an "effect size". Strategies with an effect size above 0.4 are said to have a big impact on learning. So you can see which strategies have a big impact on learning and why. Still you have to take into account that you'll have to adjust the strategies to your own context and make it yours. Some strategies take little time and effort but have a big impact.

2.4 Evidence based education and inclusion

Inclusion can be comprehended from several different perspectives: community oriented, individually oriented or placement oriented. In the community-oriented definition, diversity is seen as enriching and where students are educational and social involved. Within education, the individually oriented perspective prevails - meaning that there is a risk of missing the importance of an overall understanding/the whole picture. Therefore, this local project also strives to apply a community oriented perspective alongside the individually oriented perspective. To set common social goals (group development) for students and making these goals known to the children is an important aspect of an inclusive school.

Community oriented and Individually oriented perspectives on inclusion	Placement oriented perspectives on inclusion
Does the education increase the level of community? Does the education promote participation in learning? Does the education promote students social relations?	Is inclusion good? What effects does inclusion have?

Inkluderande undervisning – vad kan man lära av forskningen, SPSM (<https://webbshop.spsm.se/inkluderande-undervisning/>)

With the perspective to the left (community oriented and individually oriented perspectives), inclusion is something that you strive for. Students being involved in a learning community, is something that hardly anyone would argue against. So when we investigate processes of inclusion we do it in light of the perspectives in the left column.

Within research regarding inclusive processes there is an emphasis on the importance of developing the ability to:

- Create constructive leadership.
- Provide proactive development support.
- Define 'inclusion' as a concept and develop a common understanding of this.
- Find out how inclusive the students' environment is (potentially also for staff).
- Make changes.
- Explore effects/ monitor and evaluate.

(Skoglund, P., 2014)

2.4.1 Swedish curriculum emphasises values related to inclusion

We have tried to break down the various components of inclusion which are:

Equivalence, accessibility and participation.

The Swedish Curriculum for the compulsory school, preschool class and the recreation centre, 2011 emphasises these values:

"It is not in itself sufficient that teaching only imparts knowledge about fundamental democratic values. Democratic working forms should also be applied in practice and prepare pupils for active participation in the life of society."

"An equivalent education Teaching should be adapted to each pupil's circumstances and needs. It should promote the pupils' further learning and acquisition of knowledge based on pupils' backgrounds, earlier experience, language and knowledge.

and the observed lessons are discussed regarding to these terms... "

page 10 (<http://korta.nu/Kg5>)

2.4.2 Equivalence

It is important that each teacher can determine the content of subjects in order to maintain equivalence of education across the country (OECD, 2015).

2.4.3 Accessibility

A broad concept referring to the ways teachers can adapt and organize the physical environment, the educational- and social learning environment. The extent to which you succeed to adapt the learning environment has an impact on the students' ability to be included at school.

2.4.4 Aspects of participation

Students' influence on decision-making, students' participation in learning activities and students' own thoughts and opinions on their situation at school.

This could also be perceived as a matter of leading yourself, leading others and being led (Skoglund).

It is however not simply a question of how aspects of participation are carried out in the classroom.

Inclusive education is something that is done on all levels of the organization – leading us to analyse

the project with these aspects in mind.

2.4.5 Efficiency and inclusion - effects of different teaching/learning strategies

Another definition of inclusion is related to evidensbaserad research of Inclusion as measuring increased learning, but the school has also other goals. For instance John Hattie's research described in the book *Visible learning*, different factors which increase the efficiency of learning and results of different knowledge tests. It's important that teachers are familiar with inclusive strategies that are highlighted in meta-analysis, but it is also important to know that different strategies can effect some learning-goals positive but may have negative effects on other goals (Nilholm, C. & Göransson, K., 2014).

David Mitchell is an adjunct professor at the University of Canterbury in Christchurch, New Zealand. Mitchell is a consultant in inclusive education and has written the book *What really works in Special och Inclusive Education. Using evidence-based strategies*. David Mitchell presents a compilation and analysis of different teaching strategies that has been scientifically proven successful for students with different types of learning difficulties. The majority of Mitchell's research is from the United States and the United Kingdom as well as 14 other countries, including Sweden and Denmark.

The local working group in the project has read his book, focusing the strategies peer tutoring, formative assessment and feedback.

2.4.6 Peer Tutoring, cooperative group teaching/learning and formative assessment

Peers can have different roles when they support each others learning and this can be carried out during the teachers supervision. Peer tutoring and cooperative Group teaching are two strategies that are closely connected. The peer tutor needs training in order to give constructive feedback to another student. It might give teachers more time to spend with other learners. There can be some risks for instance that the feedback is wrong (Mitchell, 2014).

Formative assessment combined with feedback is one of the most powerful strategies and the point is to provide feedback both for learners and teachers which means that teaching and learning is interactive. The model relates to a cognitive/constructivist approach to learning. Using the strategies the teacher can learn about the students learning and needs. There can be some risks for instance when it's deficit-driven (Mitchell, 2014).

2.4.6.1 Peer tutoring

Peer tutoring is a strategy that can activate learners as resources for each other.

The strategy can promote inclusion and learning for instance by developing communication skills, promote self-determination and it can be motivational for both partners (Mitchell, 2014). Peer tutoring can be related to the Swedish curriculum which describes learning as both an individual process and a social process (Skolverket, 2011).

2.4.6.2 Cooperative group teaching/learning

This strategy has four underlying ideas; interdependence, individual accountability, cooperation and evaluation. The students seek to achieve a group goal, each student is responsible for his or her own learning which has to contribute to the group goal. The learners discuss, help each others and solve problems. The students evaluate their work and how they have been working together (Mitchell, 2014).

2.4.6.3 Formative assessment

There are many definitions of formative assessment. In the original overview Black and William defined formative assessment as "including all activities as teachers and/or their students undertakes that gives information to use feedback for adaption of the education and teacheractivities they are a part of" (Black & William. 1998 a.p7).

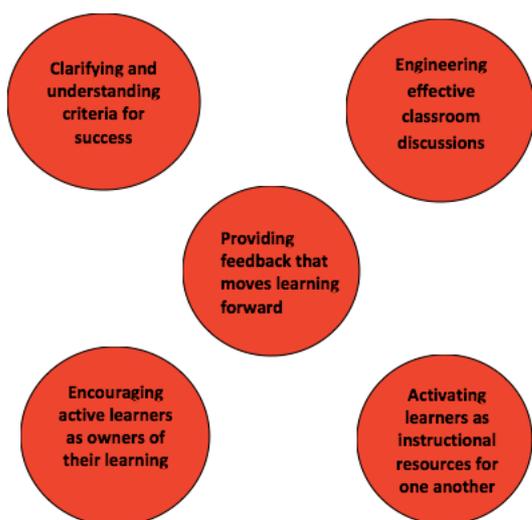
An assessment according to Dylan William (William, 2009) "functions formatively to the extent that evidence about student achievement elicited by the assessment is interpreted and used to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions that would have been taken in the absence of that evidence".

William relates to definition of formative assessment relying of two parts; on one hand putting focus on the student as an active agent who participates actively in relation to what kind of feedback they receive. On the other hand the teacher as a first agent where the teachers needs assessment from students in order to keep on planning and educate.

The term of formative assessment was first used in 1967 by Michael Scriven to describe what part "the ongoing improvement of educationplan" (Scriven, 1967, p.41). He puts this in a contrast to the summative assessment which had another approach to the educational system.

The term "formative" was not used that much the following twenty years aside from a couple of studies of methods for integrating assessment and education. In 1987 and 1988 (Gary Natriello and Terence Crooks) two research reviews were published stating that classroom assessment had a strong and negative impact on students learning. However it also said in the report that even though it could have negative impact it was difficult to define why. In the late 90s Dylan William and Paul Black tried to update these reports and one of the most challenging tasks for them was to define their research area. During this process they found evidence suggesting that the use of assessment to adapt education - especially on classroom level in many cases came to double the impact of students learning. The results of the work of Black and William did not develop into a meta-analysis. Instead they wanted to understand the research that they found. To understand and explore how these results resulted in schools they worked with a number of teachers consisting of two parts; one part where the teachers became familiar with the research and the other part where the researchers visited the classrooms. Out from these observations it was hard to find a universal model for all classrooms but a number of strategies/techniques for formative assessment were found out. Based on that all education shortly is an involvement of three individuals (the student, a classmate and the teacher and three key processes: where the students currently are in their learning process, where they are headed and what they can do to get there. If these roles and the following key activities are combined, they will develop in to five key strategies (Leahy, Lyon, Thompson & William, 2005).

Five strategies are the core of successful formative assessment practice in the classroom (William, 2011):



2.4.7 The Collaborative & Proactive Solutions

Ross Greene is the founder and Director of *Lives in the Balance* and the originator of the *Collaborative & Proactive Solutions* approach (CPS). He served on the faculty at Harvard Medical School for over 20 years, and is now adjunct Associate Professor in the Department of Psychology at Virginia Tech.

When we talk about inclusion, there is often one group of pupils that creates a big challenge for the teacher; the pupils with a challenging behavior. This group often gets in to conflicts with peers, adults and sometimes as well with or having problems with attending classes and not seldom get the blame for negative situations. During the TeachLearn project in Mölndal the psychologists in the workinggroup gave a short introduction to Ross Greene’s method CPS.

According to Ross W. Greene, when you are working with children you need a philosophy. This is especially important when you are working with challenging children, because your philosophy will guide your actions - particularly in difficult situations. The philosophy that guides Ross Greene is; “kids do well if they can” (Greene, R. W., 2011). With this philosophy in mind, one comes to understand that the reason as to why a pupil is behaving negatively in a certain situation is not because the pupil does not *want* to behave well (which often is a common misconception). Rather, it is because the pupil does not have the skills required to handle the situation. In other words; although a pupil wishes to act in a constructive way that leads to a positive result, the pupil currently does not have the ability to do so.

If the demand that you have on a pupil exceed their abilities, it is likely to lead to negative behaviour because the pupil finds it too difficult to adjust or behave in an expected way. Applying Greene’s philosophy here, we believe that if a child can do well, they will do well. This leads to an approach towards trying to understand more precisely what it is that is getting in the pupil’s way to behave more constructively. Or, in other words, what kind of lagging skills the pupil needs to develop. Examples of skills could be flexibility; the ability to adapt, managing one’s emotional response to frustration, employing a problem solving approach. A lack of these skills often manifests itself in a difficulty to maintain focus, or expressing one’s concerns, needs or thoughts in words and having troubles considering a range of solutions to a problem. Considering these abilities un- or under-developed means that there is room for development – in collaboration with the student, we can create an environment of change in which the student is able to develop the skills they are currently lacking.

The Collaborative & Proactive Solutions (CPS) – method consists of several different steps. The first step is to make an assessment of the pupil's lagging skills and the difficulties or problems the pupil get into because of his or her lagging skills. You are encouraged to use a tool called *Assessment of Lagging Skills and Unsolved Problems (ALSUP)* to assist your evaluation.

These lagging skills are skills that Ross Greene has identified as frequently occurring in contexts of conflict and unruly behaviour. They can broadly be divided into the following categories; executive function, language skills, social skills and emotional skills. Executive function is an umbrella term for cognitive processes such as planning, working memory, attention, inhibition, self-monitoring, self-regulation and mental flexibility. These functions are managed by the prefrontal areas of the frontal lobes (Goldstein & Naglieri, 2014)

After having identified lagging skills and unolved problems, the collaboration with the pupil starts - what Ross Greene refers to as *Plan B*. Plan B consists of three steps; the Empathy step, the Define the problem step and the Invitation step.

To learn more about the CPS method, please visit the website www.livesinthebalance.org. Here, you can find information about the method and a lot of other helpful material that is free to use.

CPS and Inclusion

There is a higher risk for children with lagging developed skills to end up in conflict with staff and other students at the school. They might also experience greater difficulties in terms of being able to follow the classroom teaching. This, in turn, could lead to stigmatization – on a social as well as on an educational level. The students run the risk of becoming isolated from the group, leading to them feeling excluded and misunderstood. As a consequence of their unruly behaviour, the students might be placed in smaller groups and/or assigned an assistant teacher and in this way becoming increasingly isolated during breaks and social activities. Another consequence might be that these students are not able to utilize the teaching provided and therefore struggle to meet targets.

Working to identify students' lagging skills and the problems that arise as a consequence of these, coupled with the collaborative problem-solving done by teachers and students together is a way of working for increased inclusiveness in school. This work creates opportunities for the students in question to be actively engaged in the larger student group – both in teaching situations and social contexts. During the 'learning visits', we analysed and problematized the issue of inclusion and how it can be further developed, by asking what skills are required for experiencing inclusion in school to a greater extent.

2.4.8 Theory of learning

Theoretical views behind our design of the course are grounded in socio-cultural learning.

Susan Tetler (2012) describes how differentiated teaching is based on Vygotsky's view of learning as a social process where the teaching has both individual goals for students as well as common goals for the group. Tetler also believes that there is a great unexplored potential in collaborative learning and ways of learning where the students can support eachother in different ways.

Furthermore, Tetler (2012) brings up the importance of the development of collaborative skills for all students. Our implementation strategies are based on communication, participation and collaboration.

2.4.9 Participant observation and continuing professional development

In a society characterised by continuously increasing complexity and change, tools that support a constantly learning organisation are important. Therefore, standardised methods and approaches are less central. In this way, observations can be seen as a part of the teacher's didactic work. Unlike interview-situations, observation does not convey what participants are thinking, feeling and experiencing (Bjørndahl, 2005). Participant observation means that teachers explore their own organisation (educational activity) by carrying out two actions at the same time: observing *and* engaging in informal conversations with participants. The degree of participation varies, on a scale of high participation to low participation: i.e. only observation (ibid.). The observations conducted in this project can be described as exploratory with a low level of participation. The teachers and a high level of openness regarding the role as an observer and the subject matter of the observations. They could also be referred to as observer-as-participant (Hammersley & Atkinson, 1995).

In continuing professional development (CPD) it is important that each participant's professional knowledge and experiences are contributing to collective learning and knowledge. *"CPD is about improving teachers' pedagogical skills and actual teaching, as well as gaining new insights into students' learning."* (Langelotz & Rönnerman, 2014). The local working group, leading workshops/seminars and meeting small groups of professionals, had the role of facilitator and moderator, but this role could also be passed between participants. We carried out democratic way of talking and listening. Read more about this in the chapter of implementation below.

The researchers in the project related the results to the theory of practice architectures; sayings, doings and relatings according to what enable or constrain inclusion. Read more about practice architecture in Langelotz & Rönnerman (2014).

3. HOW DO CHILDREN LEARN? HOW DO WE MAKE LEARNING VISIBLE IN THE CLASSROOM?

3.1 What is learning?

Using evidence based practice in the field of education implies a precondition for teachers. If we want to know why educational strategies work, we have to understand how students learn. Learning is not just remembering the information a teacher gives. That is called 'surface learning'. Deeper learning implies other strategies. Deeper learning is an active process in which pupils make a personal interpretation of the information. They give meaning to it in relation with their own context and underlying mental constructions. Relations are made between these constructs and by that, active knowledge is linked to earlier learning. Learning presumes that a student can translate the instruction to a deeper meaning. The surface and deeper learning must be in balance. It is a constantly interaction between both ways of learning.

Some mechanisms to create deeper learning in practice can be easily used and have a great impact (like for instance give pupils time (time to think and time to practice)).

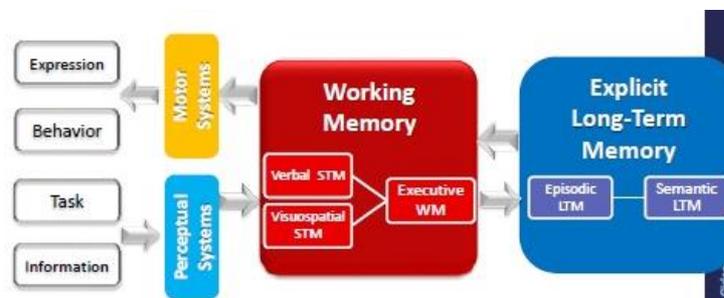
3.2 How do children learn? (based on the keynote of Gisleen Rauws on the Springcourse & Multiplier Event Evidence Based Education, 9-10/06/2016, Granada)

3.2.1 Meta-memory

The mental processes involved in learning are complex. There are different elements pupils have to think about when learning new things. We call this meta-memory. It is a kind of metacognition and includes different aspects: the understanding of how human memory works (the structures and processes), the self-awareness of personal memory's strengths and weaknesses, knowing what you know, the conscious control of memory, knowledge and regulation of effective memory strategies (knowing the efficacy of different strategies and knowing when to use which one). It's important to know that meta-memory enhances learning. A well-developed meta-memory equals better control of memory processes and flexible use of effective memory strategies.

When we know how children learn, we know how to maximize the teaching practice.

3.2.2 Information processing



(McGrew, 2015)

The **working memory** is a kind of workstation with limited capacity that has to remain active in order not to lose information. It is a kind of bottle-neck-system in learning: the longer information can be held in working memory, the more likely it will be encoded in long-term memory. Thus working memory is very important when we are learning new things.

The working memory has a limited storage capacity: new information can be stored two to three seconds, is highly degraded by seven to fifteen seconds and is completely erased after twenty to thirty seconds. From a young age we learn we have to be active in our working memory, so we start to activate some inner-speech and pay attention. A normal adult can retain about seven different units passively. Once we have to manipulate the information, we are limited to two or four pieces of information at a time. It is important to know that there is a verbal and visual short-term memory: at about the age of six or seven years old children start recoding visual spatial information into verbal information.

There are ways to expand your storage capacity, like using simple rehearsal strategies such as chunking, avoiding environmental distraction, reinforcing your prior knowledge and strengthening your automated knowledge and skills. For example it becomes much easier to find the right solution for a multiplication exercise when you master the tables of multiplication. Also prior knowledge is really important: long-term memory enhances the working memory.

The cognitive load theory means there is a limited general capacity of the working memory. The more the processing demands, the less can be retained in working memory. Working memory is mostly heavily loaded during normal classroom learning. For example, the pupils have to process information

while retaining verbal instructions: listen to the teacher while taking notes, follow complex instructions, retrieve prior knowledge while working on a task. These are all complex tasks and the high processing demands are due to the nature of the learning content and materials, the type of instruction and the learner's internal processing.

The working memory capacity develops with age. There is much growth between the ages of 4 and 12 years but we have to realize that there are big differences between a child of 6 and 11 years old. Attention control (being an important part of the working memory) develops the least: we have to deliberately work on this in the classroom.

There are two partially overlapping processing and storage systems within the **explicit long-term memory**: the episodic memory (remembering) and the semantic memory (knowing). Episodic memory is the storage of experiences and events. All school learning is initially episodic and is subject to rapid forgetting.

Encoding is a process between the working memory and the episodic memory. We consciously connect incoming information with related information that we have in our long-term memory. The quality of encoding is influenced by focused attention, prior knowledge and the effective use of memory strategies.

Semantic memory is the storage of context-free factual and conceptual knowledge. This knowledge is organised in schemes beyond the specific learning event and that is the big difference with the episodic memory. The semantic memory has an unlimited capacity, has a visuospatial and verbal component, is gradually reorganized and provides schemes and scripts for the episodic memory.

It is important to know that memory is not only about incoming information but it is also influenced by our prior knowledge.

Consolidation is the process between episodic and semantic memory. Memories become stable and resistant to interference over time. This requires time, ranging from hours to months. The semantic memory is unlimited but consolidation processes themselves are limited. The consolidation process is primarily unconscious and mainly occurs during sleep. So it is important to tell your pupils that when you learn new information and go to sleep immediately after, you will remember around 80% of the information the next day. When you study and do other activities before going to bed, you will remember only 60% by the next day. Not only sleeping but also conscious cognitive processes (like elaborative strategies) enhance consolidation. Reactivation improves consolidation.

Retrieval creates more persistent memory traces. Practicing retrieval improves consolidation, retrieval speed (it becomes more automatic) and accuracy of retrieval. It's essential to practice this in the classroom because it has such a strong effect. Consolidation in the semantic memory takes both time and effort.

Now why do we forget? It can be due to a lack of consolidation, a natural process of decay, interference because of the similarity of information or failure of retrieval. Less forgetting happens by relearning and overlearning, extending the interval between learning sessions and in depth-knowledge (not superficial learning but connecting the new information to schemes in our semantic memory which makes it easier to remember afterwards).

3.3 How do we make learning visible in the classroom?

Achievement in schools is maximized when teachers SEE learning through the eyes of a student and when students SEE themselves as their own teachers (Hattie & Yates (2014, p.xi)).

Teachers should reflect on the impact they have on the learning of their pupils and adjust their teaching according to the feedback they're getting about their impact. Hattie & Yates (2014) want to encourage teachers to set appropriate challenges based on where the pupil currently is and what the next step is, to have high expectations that all pupils can learn, to welcome errors as opportunities to learn and to promote the language of learning in the classroom.

Pupils need to know where they are in their learning process and what the next step is in reaching the success criteria. Setting challenging goals gives pupils hold and a clear view of what is to be expected at the end of the lesson. Furthermore, pupils need to acquire language to talk about their learning process and their learning strategies. Pupils should be able to talk about the cognitive strategies they used to complete a task and to give effective feedback to their peers.

Help children develop strategies such as asking for help, rehearsal, making notes, etc. Hattie also mentions the importance of 'knowing what to do when you don't know what to do'. We need to deliberately teach pupils learning strategies in the context and teach them when to use a specific strategy.

3.4 Classroom instruction that supports memory

When teachers adopt more instructional practices that specifically support memory, it enhances learning and performance of all students. Especially students with difficulties in one or more aspects of memory will benefit, because they are least likely to discover memory strategies of their own.

As a teacher, you can reduce the cognitive load of the learning content:

- Simplify complex and difficult learning content if possible;
- Limit the amount of new material, break it down to smaller pieces;
- Introduce new content gradually;
- Organize information (connect the whole to the parts, chunk information into meaningful units);
- Avoid the 'split attention' effect (try to integrate pictures and diagrams with text and labels, so students don't have to switch their attention between different information sources);
- Use completed and partially completed examples;
- Teach learning contents that fit prior knowledge;
- Make lessons meaningful;
- Supply and encourage use of memory aids (this gives pupils space to store new information, so they don't have to remember and process at the same time).

Secondly, a teacher can reduce the cognitive load of instruction to leave more capacity left for storage. Some good practices that are also relevant to a more general context:

- Set learning objectives and refer to them during the class;
- Activate the prior knowledge;
- Simplify grammatical sentence structure when you talk as a teacher;
- Slow down the pace of lesson presentation;
- Recognize when working memory fails for instance when pupils are not finishing tasks anymore or not following instructions (so the teacher will have to slow down);
- Repeat important information;

- Break multistep tasks into separate independent steps;
- Combine visual and verbal learning (the strongest retention happens when you combine both);
- Be aware of demanding mental processing tasks or activities;
- Make sure there is enough active learning;
- Avoid multitasking especially with new material;
- Provide written notes;
- Minimize copying;
- Build in classroom routines and procedures (low processing without need to remember).

There are some simple memory strategies that the teacher can teach his pupils. Children might know these strategies but will not always use them when necessary, so the teacher needs to teach explicitly when to use these strategies. Some examples: rehearsal, chunking, visualization and classification.

It's important to explicitly teach cognitive strategies to the pupils, to demonstrate flexible use of memory strategies, explain how to apply strategies to the task and stimulate use of memory strategies. Offer practice opportunities to experience the effectivity of strategies. Stimulate the search of strategies that fit the individual student. For instance:

- One of the most effective strategy is gradually increasing the intervals between reviews: an end-of-the-lesson review, review the next day, a week later and then after 2- and 4-week intervals. Young children should learn this in class, because it increases effective learning with 15%. Another effective strategy is delay until effortful retrieval occurs.
- Repeated testing, retrieval and corrective feedback is extremely effective. Five rounds of testing have shown to be more effective than 15 rounds of rehearsal. This demonstrates how large the effect of testing actually is. Other essential elements: do a first quiz immediately or within a day, expand the intervals like a periodic review, use recall-type tests (no multiple choice), incorporate new questions each time, provide corrective feedback soon after testing (preferably the same day), schedule tests in advance, learn pupils to do self-testing.
- Use elaboration strategies to relate new information to prior knowledge. Teachers should encourage pupils to think about how things are connected, because this will enhance in-depth (versus superficial) processing and will create connections between neuro-networks. For instance, teachers can begin lessons with advance organizer; reflect on a concept before instruction; allow enough time to retrieve related information; summarize information and use the interrogative approach ("Why does this make sense?", "Why is this true?").
- Apply dual encoding: provide visual representation and mental imagery along with verbal instruction. The teacher can use pictures, drawings, graphs, mind maps and can encourage students to visualize verbal information. This also supports procedural learning: helping students to visualize each step is almost as effective as actual practice. By increasing the number of pathways available for retrieval, the consolidation and encoding will become stronger.
- Teaching reading comprehension strategies increases retention and recall as they induce elaboration. A good example is PQRS: (1) Preview and skim the passage, (2) generate Questions that need answers (who, what, when, where, why), (3) actively Read the passage to look for answers to the questions, (4) Study the information, (5) self-Testing on the answers to the questions.
- Mnemonics is associating new information with well-established, logically unrelated memory representations. It gives an easy and automatic recall. Mnemonics are especially useful when no

prior knowledge exists. The use of a keyword offers a good example. If a student needs to learn the target word 'gato' (Spanish for cat), he/she needs to think about a familiar word that sounds like the target word. This is called the keyword, for instance 'gate'. Then the student has to imagine a cat walking over a gate, creating a mental image in which the keyword is interacting with the target word. To retrieve the information, the student has to first retrieve the keyword gate and afterwards the image. This technique is highly effective for learning terminology, facts and vocabulary, even for young children. It creates retention over long periods of time and is easily integrated into instruction.

4. WHAT IS EFFECTIVE FEEDBACK?

Essay by Jan Coppieters (PVOOC Oost-Vlaanderen)

"(...) it soon became clear that feedback was among the most powerful influences on achievement".
John Hattie (2009)

4.1 Introduction

As a child I used to go to music classes to learn how to play the clarinet. One day my teacher told the boy whose turn was right before mine: "You're a zero. I'm wasting my time with you. You'd better go and do something else. It's a disgrace." The boy burst into tears and played even worse... Although this feedback was not addressed to me, I also experienced a strong physical reaction. What must it have been like for this boy to receive such negative feedback about his capacities or growth potential? How did he feel? Did he also experience a physical reaction? Such personal feedback, but also feedback you take in a personal way, can be experienced as a threat. There is a risk here of shutting down mentally and thus not learning at all from the feedback. In other words, not all kinds of feedback have a motivational influence on learning and development. Our brain shuts down when our ego and autonomy are put under pressure (Dirksen et al., 2014). Another girl in the music class got a lot of praise from the same teacher: "You're so bright and talented! I wish all my students were like you." Was this the right way of providing feedback? What effect does this kind of feedback have on students' results?

When Hattie and Timperley systematically investigated the meaning of feedback, it became clear why it is such an important skill for teachers. They found that feedback is able to enhance both learning and teaching. They define feedback as information provided by a teacher, peer, parent or expert on the aspects of an individual's performance or understanding in relation to the goal that has to be reached (Hattie and Timperley, 2007). Effective feedback tells pupils how well they performed to be able to reach the set goal and gives them information on how to perform even better. It is motivating. Feedback and appreciation are vital for learning new and challenging things. Without feedback you can't be sure if you are heading in the right direction.

Feedback can only be effective if it follows effective instruction and if it goal-oriented. In this case, feedback gives the pupils information on how well they are reaching the goals. Good feedback indicates success criteria for the achievement of the goals and is most effective when the goals are clearly formulated. Thanks to feedback pupils can reduce the gap between where they currently are

and where they are supposed to be.

4.2 Formative assessment and feedback

Mitchell (2014) points to the connection between formative assessment and feedback. Formative assessment evaluates learners' progress during a course or module in order to give them opportunities to improve. It is not only a check of what was learnt (knowledge, attitudes and skills), but also of the way this learning progressed. According to Shute (2008, p. 154) formative feedback is "information that is transferred to the pupil and is meant to change his or her thinking or behavior, with the goal of improving his/her learning." The more a test leads to feedback with which pupils can improve their performances, the more we talk about formative assessment.

Summative assessment evaluates learners' performance at the end of a course or module. The results count towards making a final judgment on what the learners have achieved.

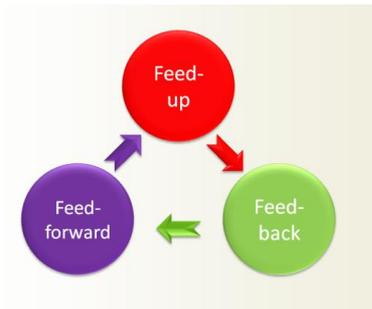
We use formative assessment and feedback to regularly check and inform learners of their progress. Mitchell (2014) gives this strategy a four stars rating. This means that there is a convincing, or strong, evidence of effectiveness. Learners with special educational needs undoubtedly benefit from the strategy. The scores of the learner at the 50th percentile would increase to at least the 76th percentile. Hattie (2009) discovered an effect size of 0.90 for formative evaluation and an effect size of 0.73 for feedback, which makes it among the most powerful influences on learning.

Formative assessment and feedback implies the teacher evaluates the pupils during class, gives them regular feedback and adapts his way of teaching if necessary. As tests are more and more connected to the set goals, the teacher will find out through formative assessment why some pupils do not succeed. Next step can for example consist of the teacher explaining a concept again, applying a slower pace when presenting content, explaining an element in depth, etcetera, in order to improve the performances of the pupils.

It is important to give pupils a fair chance to show their learning progress. For example: a child that has a writing deficit may encounter difficulties when presented with a written test. Meirsschaut, Monsecour and Wilssens (2015) suggest providing different possibilities for pupils to achieve action and expression. Flexible testing of learning goals means offering different methods to pupils in order to express themselves, offering different tools to develop and work something out, and letting them demonstrate in different ways what they have learned, with customized support. From the feedback the pupil can learn what to work on and the teacher can evaluate himself and check if his approach is indeed paying off.

4.3 What are the components of effective feedback?

Effective feedback wants to help students be successful by giving them information on their current level of knowledge and insight. It is okay to make mistakes, as the goal is to heighten the level. The teacher helps by giving feedback: he provides information and instructions on task execution and gives hints to help the pupil in achieving the desired goal. Negative feedback can be challenging (as the student will set higher goals because he/she is not satisfied with his/her work), but students with low self-esteem mainly need positive feedback. It increases their involvement and their commitment to carry out the task until the end.



Effective feedback provides an answer to three complementary questions. The answers to these three questions enhance learning and close the gap between the current level and the desired level.

With these 3 questions the teachers asks himself what the pupil will tell about his/her work, how he/she will do that, what the pupil will do with it and how the learning of the pupil will improve. The teacher makes sure there is high commitment level and takes care of the self-esteem of the pupil.

Feed-up: Where am I going? What is my goal? Which results do I want?

Examples: I want to be able to compare two recipes with each other. I want to be able to calculate the volume of a sphere. I want to improve my tennis serve.

The setting of a goal can make the difference. The goal has to be challenging.

Feed-back: Where am I now? How am I doing? How did I manage the goal until now?

To what extent have I reached the goal so far? How have I improved compared to earlier performances? Did I do well or not?

Examples: I'm already throwing the ball in the correct way when serving, but am not hitting it perfectly yet.

Hattie (2009) suggests 5 strategies which help the pupil to know how he/she is doing:

- Clarity and openness about the learning goals and success criteria
- Provide clear discussions, questions and learning tasks in the class
- Give feedback that helps the pupils move forward
- Stimulate the pupils so they can give input on their own learning
- Peers as a source of information to each other.

Feed-forward: How do I close the gap in order to be able to reach the set goals? Where to go next? What do I do to improve?

What actions do I have to take in order to make progress?

Example: I need to know how to handle a task that tells me to compare two or more things with each other. I need to set myself higher demands. I need to learn how to put new information in a correct scheme. I have to search for extra information to be able to formulate a more complete answer.

Based on the feedback the gap should be reduced between the position where the pupil is and where he/she should be.

4.4 The four feedback levels

Not only the three feedback questions influence the effect of feedback, but also the level at which the feedback is given plays a role. Hattie and Timperley (2007) distinguish 4 levels of feedback:

Task and product level or 'corrective feedback'. Gives pupils precise information about their

performance:

- Answer correct or incorrect
- Behavior acceptable or not
- Interpretation right or wrong

Comments on tasks by teachers should help the pupil to learn from his/her mistakes. The feedback should encourage the pupil to look for more or different information, and should help to achieve the learning goal and to better regulate the learning behavior.

Process level. Which strategies are needed for the execution of the task? How did the process go that is necessary to execute the task properly? Are there any alternative strategies? The teacher pays attention to how the pupil discovers his/her own errors and if he/she learns from his/her mistakes. The pupil should learn to see the connection between effort and success. Strategies and processes improve deeper learning, which makes it possible for the pupil to make the transfer to other more difficult tasks or assignments.

Self regulation level or metacognitive level. Feedback on the approach of the pupil, how he/she makes the activities progress in an orderly way and evaluates him/herself during this process. The pupil receives information on what is necessary to monitor his/her own learning process. Examples of this monitoring, directing and evaluating are:

- Learning how to evaluate themselves
- Checking the work before handing it in
- Asking advice from peers
- Inventorying the steps to be taken
- Learning to recognize and use feedback
- Learning to ask for help (pupils with low self-esteem never do!)

Self-level, the pupil as an individual. This feedback directed towards the individual is usually not focused towards task execution. The feedback given by the music teacher in the introduction is a perfect example. This feedback rarely answers the three questions of effective feedback. Teachers should be aware that it is important to appreciate positively without mingling this with feedback information. The appreciation should be aimed at the effort that the approach asked for and the engagement of the pupil during the execution of the task. See also 5. Mindset.

The three first levels are especially important for pupils to develop into self regulating, intrinsically motivated individuals.

4.5 Mindset

Dirksen et al. (2014) say the following about the focus of feedback: "Give feedback on approach, process and effort. All that you focus on, will grow in the mind. If you want to stimulate students to be open to learning, then appreciate the learning in itself. This means you have to appreciate how they tackle challenges, effort, obstacles and the making of mistakes. Give mainly feedback on the learning process. Of course the end result is important, but feedback on the process of learning leads to better end results. Just 'good job' or 'well done' are not sufficient." (p. 186)

C. Dweck (<https://www.youtube.com/watch?v=26h02O1B3eo>) discovered how someone's mindset influences behavior and achievements. Students seem to have two different kinds of 'mindset' about

their own intelligence. Some think that their intelligence is a fixed, never changing characteristic. Dweck calls this the 'fixed mindset'. This belief makes them worried about their own intelligence level. They fear challenges. Making mistakes upsets them and in the long term they achieve on a lower level. Other students have what Dweck calls, a 'growth mindset'. They are convinced that their intelligence and talents can be developed by hard work. They are eager to learn and don't worry all the time about how smart they might appear to be. They want to become smarter and want to take challenges. They enjoy difficulties. They expect that they will have to deliver efforts and in the long term they achieve better.

Growth-oriented feedback and appreciation influence learnability of students: they stimulate a growth mindset and more self-esteem. Even Niels Bohr, one of the founding fathers of atom physics, said: "An expert is someone who has made every possible mistake in his/her discipline."

Teachers have to believe in the developability of their students, because this belief resounds in their statements, mimic, behavior and the kind of feedback they give. Johan Cruijff said you can only see development if you actually believe in it. Jacobson and Rosenthal (1968) also demonstrated that the expectations of teachers regarding the growth potential of a student actually influences the achievements of that particular student.

Teachers should formulate feedback in a positive and growth oriented way. Example: 'I think you did a good job with this, because ...' or 'I notice that you made good progress, because...'

4.6 Pedagogical climate

Kamphuis & Vernooij (2011) emphasize that the pedagogical climate in the classroom is of great importance for feedback. Without trust between pupil and teacher, effective feedback is impossible. How feedback is received is more important than how feedback is given. Therefore, a good trust relationship between teacher and pupil is essential.

Hattie (2013) says that expert teachers are proficient at creating an optimal classroom climate for learning (p. 45): "An optimal classroom climate for learning is one that generates an atmosphere of trust – a climate in which it is understood that it is okay to make mistakes, because mistakes are the essence of learning. For students, the process of reconceptualizing what they know so that they can take in board new understandings may mean identifying errors and disbanding previous ideas. In so many classrooms, the greatest reason why students do not like to expose their mistakes is because of their peers: peers can be nasty, brutal and viral. Expert teachers create classroom climates that welcome admission of errors. They achieve this by developing a climate of trust between teacher and student, and between students. The climate is one in which 'learning is cool', worth engaging in, and everyone – teacher and students – is involved in the process of learning. It is a climate in which it is okay to acknowledge that the process of learning is rarely linear, requires commitment and investment of effort, and has many ups and downs in knowing, not knowing, and in building confidence that we *can* know. It is a climate in which error is welcomed, in which student questioning is high, in which engagement is the norm, and in which student scan gain reputations as effective learners." (p. 45)

Teachers should explicitly learn their pupils that making mistakes is important and positive. They have to provide a safe class environment with a focus on self-regulation.

"I've missed more than nine thousand shots in my career. I've lost almost three hundred games. Twenty-six times I've been trusted to take the game-winning shot and missed. I've failed over and over and over again in my life. And that is why I succeed." (Michael Jordan).

4.7 The art of giving feedback

To be effective, at least 3 conditions have to be met when giving feedback:

- The goal is clear and known to the pupils;
- The teacher gave a powerful and explicit instruction;
- There is a positive pedagogical class climate.

Tips for giving effective feedback:

- Focus on the **task**, not the student;
- **Purposeful**: it's about learning, not about the achievement. Welcome mistakes. Evaluate behavior, the task, etcetera, but not the individual;
- **Quickly**: especially when giving oral feedback. Research shows that you achieve 20% better if you know feedback follows quickly. The fear of disappointing results motivates to achieve better. (Kettle & Häubl, 2010);
- **Explicit** and **concrete**. Describe exactly what's right and what's almost right. The pupil should know why something is right or wrong. Be detailed. Examples: "Well done for using the right formula.", "I can see where you got confused: you transposed East-Flanders and West-Flanders. Check it again in your atlas";
- **Dosed**: in comprehensive units; don't bother the pupil with long explanations;
- Find a good balance between positive and negative feedback. **Positive** feedback has a favorable effect on the pupils' motivation, especially pupils with low self-esteem need it. Lieberman (2013) demonstrated that appreciative comments are gratifying, also for our brain. They activate the striatum and the release of dopamine. Dirksen, De Boer and Willems (2014) notice a difference in feedback according to age: the brain can already process positive feedback at a young age, but the processing of negative feedback develops later on. That's why young children mainly learn because they know when they do something the right way. Older children and teens learn more from mistakes and corrections. The switch takes place between the age of 8 and 12;
- Aimed at the use of a **strategy** and not on skills or attempts of the pupil;
- Give feedback on the **process of learning** (how does the pupil deal with challenges, mistakes, effort and disappointments) and not on the alleged talent, learning ability or only the end result. Give feedback on effort, endurance, accepting of challenges, and approach. Emphasize what you want to reinforce;
- **Useful** for pupils. Give suggestions for improvement. Use clear and specific language. Use short sentences;
- **Adapted to task complexity**. A complex task needs complex feedback;
- Give the pupil space to **respond**. For instance, ask what he/she thinks you meant with the feedback;
- **Sincerely** (true), unbiased and objective.

To avoid:

- Making normative comparisons;
- Expressing overall quality judgments;
- Giving feedback which discourages or lowers the self-esteem;
- Interrupting the pupil when he is working on a task (instead only give feedback when pupils have investigated a solution, because this leads to more self regulation);

- Combining formative feedback with grades: do not give grades to students when they are still learning;
- Giving of feedback which installs a fixed mindset ('Gosh, you're smart or good at...' or 'It's better to accept that you will never be good at this'.) See Mueller and Dweck (1998): the way you give feedback immediately after the task influences the pupil to keep on going or to pull out when a similar task is given later on. Pupils seem to perform better at tasks if they have received positive feedback on their effort for a similar task right before (Dirksen, De Boer and Willemse, 2014).

4.8 The frequency of feedback

Hattie (2009) advises to give feedback very often. But how can you do that? Doug Lemov (2012) describes 49 didactical techniques in a clear and motivational way. These 49 Teach-techniques are specific, practical, executable and help to raise the bar with your pupils, to keep their focus and to work on a good class climate. A few examples:

- Lightning turn: the teacher gives pupils a turn, regardless of the fact if they raised a finger. This way the teacher can check effectively and systematically if everyone understood. Lightning turns also speeds things up during the lesson and enables the teacher to divide questions more evenly over the whole class. The teacher announces when he/she will give lightning turns, in a systematic way, and makes sure the pupils know that the focus is on the question and not the individual. The teacher maintains a positive vibe and gradually increases the difficulty level.
- Everyone writes: the teacher helps pupils to bring their ideas to a higher level by letting them briefly organize their thoughts on paper.
- Don't know doesn't count: the teacher lets the pupils know that it is okay to not know the right answer, but that he/she expects them to try. There are four basic versions:
 - Teacher gives the answer, pupil repeats it;
 - A peer gives the answer, the pupil repeats it;
 - The teacher gives a clue and the pupil uses it to find the answer;
 - A peer gives a clue and the pupils used it to find the answer.
- Good is good: demand answers that are 100% correct.
- Stretch: rewarding a good answer with more questions. You could ask for the how and why, for another method to get to the answer, for a better word, for evidence or for the pupil to use another skill.
- Test understanding: the teacher can do a random test, for example ask the answer to two good, two weaker and one mediocre pupil (see lightning turn). Increase reliability by 'stretching' and observe well.

5. APPLYING DYNAMIC ASSESSMENT TO THE EDUCATIONAL CURRICULUM. HOW CAN WE USE FORMATIVE AND DYNAMIC ASSESSMENT TO MAP LEARNING POTENTIAL?

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5.1 Introduction

Dynamic assessment, or assessment of learning potential, as it is called in Spanish-speaking countries,

is an approach to the assessment of an individual's cognitive and/or intellectual skills. Dynamic assessment seeks to determine the person's possibilities for positive change in their performance, hence the Spanish reference to learning "potential". In its broad sense, as noted by Haywood (2012), learning potential refers to implied or suspected ability to learn beyond the level that is currently being demonstrated.

From the beginnings of traditional intelligence assessment, certain authors have tried to determine this possible modifiability in persons with low performance. Binet (1911), for example, indicated the need to use a dynamic approach in assessing intelligence in order to avoid false diagnoses in children, given the large number of causes that can affect the performance demonstrated in an assessment process. Rey (1934) attempted to establish the educability of children with mental retardation, Shapiro (1951) and Volle (1957) manipulated traditional test application procedures in order to discern how these changes affected the subjects' execution, and Haussermann (1958) attempted to assess development potential (Haywood, 2012). But not until the 1970s did the dynamic assessment approach appear (Calero, 1995).

From our point of view, certain developments in psychology were necessary precursors to the appearance of Dynamic Assessment; in their order of appearance, these were:

- The influence of behavioral models, both at the theoretical level, recognizing the environmental influence on learning, and consequently on the child's cognitive and affective development; and at the methodological level, with impact on therapeutic approaches, not only in clinical contexts, but also in educational ones.
- The development of cognitive models that, with their information processing framework, made it possible to analyze a subject's performance in successive steps, encouraging the analysis and training of actions that precede the subject's final performance.
- An understanding in Europe of Vygotsky's Sociocultural Theory, which established that the sociocultural environment has the most weight in the development of higher mental processes, and mediation, is its fundamental tool.

These three contributions were necessary prerequisites to the development of the theoretical underpinnings of Dynamic Assessment, as well as the methodology that it sustains. For these reasons, not until the mid-1970s did Budoff and Feuerstein publish the first studies on this approach (Calero, 1995).

5.2 Basic concepts

Dynamic assessment is based on a concept of multidimensional intelligence, that is, intelligence as the application of cognitive and metacognitive skills to very different areas of knowledge (Gardner's Theory of Multiple Intelligences, 1983). Intelligence that is to some extent the product of the child's learning within a sociocultural context, and is demonstrated by the subject's performance on a test or (e.g., educational) task. Intellectual performance is affected by very diverse variables, and, if performance is low, it may be improved through an intervention.

In fact, the fundamental concept in regard to estimating a child's intellectual development is Vygotsky's concept of Zone of Proximal Development; as he established in 1934, although it is known in Europe in 1978; this is to be understood as the distance between "actual development as determined by independent problem solving", and "potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). In other

words, in the development of a child, we can differentiate between level of actual performance and level of “potential” performance. This assistance, or adult guidance, is also defined in Vygotsky and developed later by Feuerstein (Feuerstein & Rand, 1974), as the concept of Mediation.

Mediation is a process of interaction (eminently verbal) by which the adult (the assessor, in DA) guides the child’s interaction with the task, facilitating his or her learning, dividing execution into more accessible parts, pointing out important aspects, emphasizing rules, encouraging motivation, guiding the application, questioning the process, etc. In this process the adult takes into account all the possible difficulties that the child may encounter in the problem-solving process, whether cognitive, metacognitive and/or motivational, and provides to the child whatever resources are needed.

As noted by Haywood (2012), the concept of process (assessment--learning--assessment--learning), the idea of finding out an individual’s “potential” ability, and the sociocultural procedure that mediation implies, are three fundamental characteristics of this approach to assessment.

5.3 Methodology and utility

Following the scheme put forward by Vygotsky, DA methodology uses a test-mediation-posttest format, where the test phases are similar to traditional assessment procedures, the child performs the tasks without assistance, and where the mediation process involves the assessor’s interaction with the child, guiding his/her learning, as described above. Using this procedure, the subject’s unassisted level of execution is obtained (pretest), and an estimation of his/her possibilities for improvement when guided by an adult (difference between post- and pre-test). The latter represents an estimate of his/her cognitive modifiability and/or learning potential. In addition, important qualitative information is also obtained concerning the causes of errors, whether cognitive, metacognitive and/or affective, and about the child’s response to the assistance offered.

In short, for children with low performance or learning deficits, DA estimates their possibilities for improvement, predicts future performance, and reports on variables (cognitive and motivational) that should be trained in order to accomplish that change.

5.4 Initial directions in the development of Dynamic Assessment

The development of Dynamic Assessment, as understood from the foregoing, has arisen in connection with populations that show poor performance on traditional assessment tests of intelligence and cognitive skills. Thus, its first applications were in children with intellectual retardation, followed very soon by application to children with learning problems, sociocultural deprivation and/or language problems. Later on, certain authors perceived the utility of these techniques for populations in development, such as preschoolers, and important instruments were created, such as the ACFS by Lidz and Jepsen (2003) and the tests constructed by Tzuriel (1995). The utility of DA was also analyzed with immigrant children, who present low performance in school contexts and on traditional assessment techniques Hamers, Hessels & Luit (1991); in these groups DA was highly successful even in the detection of gifted children (Lidz & Macrine, 2001). Application was later extended to other groups with deficits, such as children with autism (Donaldson & Olswang, 2007; Nigam, 2001), the deaf (Lidz, 2004) adults with schizophrenia (Wiedl & Schottke, 1995), or brain damage, Haywood & Miller, 2003) elderly people with MCI,(Fernández-Ballesteros, Zamarrón & Tárraga, 2005) etc. In short, true to its origins, DA is being applied to persons who show poor performance.

The initial tasks were traditional Raven-type intelligence tests, or cognitive tasks covering basic skills, such as series, analogies, spatial reasoning, numerical reasoning, verbal reasoning, and memory. In the

case of children, the tasks evolved to more closely reflect skills considered relevant to the educational context, or to the subjects' age, and the application of DA to the educational curriculum results from this evolution.

5.5 Applications to the Educational Curriculum

There were initially two approaches in this direction. First, there was the Illinois group: Campione & Brown (1987) and Palinscar & Brown (1986) applied this approach to learning mathematics and reading, and this line was followed by other groups, who used a very structured design in proposals of computerized assessment and mediation systems for mathematics (Tissink, Hamers & Van Luit; 1993) or for foreign language teaching (Lantolf & Poehner, 2010).

Second, Lidz introduced this term and its basic principles in her 1991 text, *Practitioner's Guide to Dynamic Assessment*. She proposed Dynamic Assessment as a generic approach that can incorporate practically any specific content or be applied in any domain. Development of this approach represents an attempt to maximize the relationship between assessment and teaching. Here, assessment is designed by taking different examples from the particular plan of studies, or from the teaching objectives, or the tests and assignments created by the teachers. The idea is to establish a baseline for each child with respect to the subject matter. Set the objectives to be accomplished. Take a sample of the tasks that represent these objectives, order them according to difficulty, complexity, abstraction, content, and generalization. And apply the Dynamic Assessment format.

This format has been presented recently by Laulachlan and Carrigan (2013) in their book "*Improving Learning Through Dynamic Assessment*".

In this work, Lauchman and Carrigan unite the concepts of Dynamic Assessment and Formative Assessment, inasmuch as they share the idea of helping the assessed students to learn, to give them information about the quality of their work, involve them in the process, etc. The difference between these two approaches might lie in the importance that DA gives to basic cognitive skills over curriculum-related content.

These authors' method follows the assessment-intervention format, where the assessor assists parents and teachers in their work with the group, or the child, on basic cognitive and motivational skills that are involved in the educational curriculum.

5.6 Basic elements

In short, in order to use a cognitive education approach, that is, to apply DA within the curriculum, we need: a task, a task analysis scheme, and a mediation process.

5.6.1 A task

The task can be anything that meets certain minimum requirements in its design. Three versions must be made: for the pretest, for mediation (work in class) and for the posttest. The task chosen will correspond to our teaching objectives, it will be clear (not ambiguous), and will have a unique solution. Tasks will be established with items in increasing order of difficulty, with increasing complexity, increasing levels of abstraction and having diverse content.

Assessment tasks will be samples of the general mediation task (the task addressed in the teaching-learning process in the classroom).

5.6.2 A task analysis scheme

The task must be analyzed with a cognitive scheme, for example, Feuerstein's Cognitive Map (Feuerstein, Rand & Hoffman, 1979). The Cognitive Map is an analysis scheme modeled on information processing; it is useful both for designing the task and for interpreting the results (i.e. the individual's execution), as well as for establishing the applicable mediational interaction in assessment and/or long-term training.

Feuerstein represents the Cognitive Map with a cylinder, where tasks of increasing complexity are overlapped; these tasks are constructed and/or analyzed according to 4 parameters: content, modality, level of abstraction and level of complexity.

- **Content:** refers to the subject matter that the task is addressing (mathematics, social sciences, etc.). Content is fundamental, because it may determine a person's level of execution and/or motivation with respect to certain basic skills.
- **Modality:** the solution to a task may be reached in many different ways: graphically, verbally in writing, verbally in speech, etc.; just as in the previous parameter, the modality that is requested for the answer either facilitates or complicates a person's execution. Furthermore, if transfer (generalization of learning) is intended, both parameters must be manipulated.
- **Level of abstraction:** according to Feuerstein, this parameter refers to the distance between the mental act and the object or event that is being operated on. A task may be done directly on objects, or on graphic representations of objects, or on verbalizations of objects, or on abstractions.
- **Level of complexity:** quantity of information units needed for solving the task. How many skills does a task require in order to be solved, how many of them are known and mastered by the individual. It is also important to calibrate these issues in order to establish effective mediation. Tasks should be trained in order of increasing complexity.

The individual's approach to any such task is then analyzed according to 2 interrelated parameters: *Phase of solving the task* and *operations* (in our words: cognitive processes needed to solve it).

Based on information processing schemes, Feuerstein establishes three phases of task solving:

- **Input:** information collection phase
- **Elaboration:** rule application phase, working with the information collected
- **Output:** answer communication phase.

For each of these phases, there are specific operations that must be fulfilled:

- For input: attention, perception, self-regulation, motivation
- For elaboration: memory rules, reasoning, planning, etc.
- For output: language, evaluation of the outcome, etc.

With this scheme in place, before we work with the students, we can clarify what skills our task requires and in what order, and so be able to foresee causes of error, possible problems, assistance that might be given, resources to facilitate, etc.

This analysis, therefore, will allow us to draw out relevant information about the child's performance on the pretest, his or her possibilities for improvement and his/her strong and weak points and it will guide us in applying mediation in the teaching-learning process.

5.6.3 A mediation process

According to Haywood (1993), the following are characteristics of mediation provided by an assessor

or teacher:

- It is intentional: the mediator knows where he/she is headed. The interaction aims to produce a cognitive change in the child, every verbalization, every sign has a meaning;
- It has transcendence: the change that is sought goes beyond the specific situation, the specific task, it must be generalized, the idea is not for the child to learn a task, but to learn certain skills that are foundational to that task and to many others;
- It communicates a meaning and a purpose: the children learn to understand what a given activity is for, everything takes on meaning;
- Feelings of competence are mediated: the child perceives himself/herself as capable of executing a task well, assistance is planned out so as to avoid failure and achieve good execution;
- It regulates behavior: the child learns to hold back his/her impulsivity, to use a systematic approach to problem solving, to inhibit responses in order to have good execution;
- The task is shared: the attitude is one of participating in the solution, all of us who share in the situation are solving, learning to solve.

Unlike traditional education and traditional psychological training, in a mediational teaching process there are no instructions, there are questions about processes, there are links between similar situations (building bridges), there are requests for justification of a response, emphasis on the order, on sequence, analysis of strategies, and establishment of rules. There is progressive assistance, shaping and modeling, there is intrinsic motivation: “we do this because it is a challenge and we like challenges”. It is interesting to observe that through mediation, not only do we train formal problem solving strategies, but also behaviors in approaching problems, self-regulation, feelings of competence, expectations, etc. In other words, variables with close connections to personality and motivation are involved: being able to put oneself in someone else’s place, analyze the factors involved, regulate behavior, and above all, to use and develop verbal labels as required by mediation that is based on verbal interaction (Calero, 2012).

5.7 Benefits

While it is true that applying this methodology to the educational curriculum is not without its difficulties and effort, the benefits are undeniable. In order for it to work, the group of students must not be very large, no more than 15, and the teacher must do the preparatory work of designing the tasks and preparing the mediation. It also requires teachers to change their way of thinking, to be flexible and get involved in the process of teaching and learning. If this is achieved, the results are very valuable, because:

- The teacher’s teaching style is adjusted to the students’ learning style: the more dependent students receive greater external regulation, and the autonomous students receive less;
- It takes into account prerequisite skills that the child possesses: his/her language level, instrumental skills (reading, writing), content (biology, mathematics), etcetera;
- The task is adapted to his/her ZPD: whatever the child has not mastered is made accessible by assistance;
- The pace of the group becomes flexible: each child works at his/her own level of difficulty, of generalization, etcetera;
- The most effective children become incorporated as trainers: peers mediate their classmates;
- There is an increase in motivational variables that intervene in learning: self-efficacy, self-regulation, approach to the task;

- Errors and difficulties are prevented: The causes of error are addressed, transfer of knowledge is ensured, emphasis is given to the transcendence of what is learned, teacher-pupil relations are improved. We have a group that works together, facilitating parental involvement in the process, where parents can generalize what is being learned at home. (Calero, 2012; Haywood, 1985; Lauchman & Carrigan, 2013)

In short, this approach ensures the success of the teaching/learning process, making its application especially relevant in less advantaged groups of students: support groups for children with special educational needs, immigrant students, minority ethnic groups, and so on.

6. Implementation

6.1 Case study by the Department of School Development Mölndal, Sweden

Local team: School development and Student Health

Project manager: Gunilla Almgren Bäck

<http://www.skolutvecklingmolndal.net/teachlearn-inkludering.html>

School development requires time for critical reflection regarding one's personal teaching practice. A challenge within collegial learning is being able to develop a common language and shared understanding for processes of inclusion (Tetler 2012), in which participation is a central concept. From a previous project, I have experienced how the quality of collegial were enhanced by teacher as processleaders. Amongst other things, they were taught conversational methods that can help lift discussions from 'everyday-talk' to a level of learning connected to theory and policy documents.

After this, one of the central questions was: to what extent does the work we do in process groups/ learning groups affect the work done in student groups? Within the parameters of the TeachLearn project, myself and the school board management saw an opportunity to develop the forms of action learning/ action research we had instigated – adding tools to strengthen the connection between the professional learning and the development of the teaching.

We applied for funding and selected three schools in dialogue with the administration management and the principals. A working group consisting of key school developers and staff from Student Health was created, for which I was appointed project manager. A team of teachers and a principal from each school represented participating schools. The project has been monitored by "on-going evaluation" researchers from the University of Borås. Our work have focused development of teaching/learning strategies to promote inclusive education. The strategies are not to be seen as recipes, but instead carefully adapted to the particular group of students.

The local working team:

School development department and Student Health, Gunilla Almgren Bäck (project manager, schooldeveloper/special education), Kerstin Abrahamsson (schooldeveloper/special education), Maria Andergård (schooldeveloper/special education), Iréne Carlander-Reuterfelt (psychologist), Sofia Knüppel (school developer, EU coordinator), Niclas Långö (psychologist), Hanna Steffenburg (psychologist), Anders Eriksson (photographer; producing films)

Researchers: Lill Langelotz and Magnus Levinsson, Borås University

Reference group: Christer Ferm (Development Manager), Per Skoglund (The National Agency for special education) and headmasters on three schools.

<http://www.skolutvecklingmolndal.net/film.html>

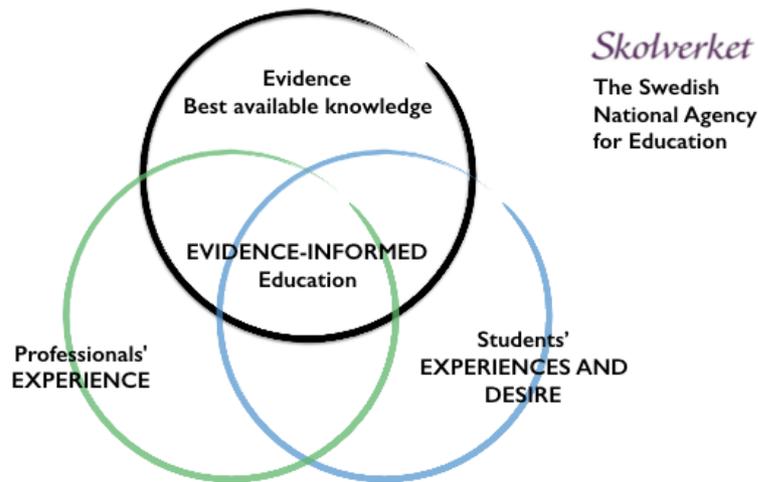
6.1.1 Background

The main question in the project TeachLearn is: *"How can an evidence based approach contribute*

to the improvement of the quality and effectiveness of our education?”

Our way of looking upon it is that improvement of quality can be reached when the education is built upon *evidence-informed* education meaning that students' experiences, desire and teachers professional skill are also important to reflect upon. Therefore, the process of our implementation strategy is based on both theory and practice.

The Swedish National Agency for Education states that education on scientific grounds and proven experience requires: a learning organisation, systematic quality work and a scientific approach – to critically evaluate what you do and why.



Project Partners

- The National Agency for Special Education
- University of Borås
- Local working teams in Mölndal, Gent, Tallinn and Granada
- The Student Health and Development unit, Mölndal
- Three primary schools in Mölndal: Toltorp, Råvekärr and Krokslätt

The researchers' position has taken the shape of interactive *ongoing evaluation and research*, following the process both during seminars and on site-work in schools. The purpose of this has been to increase the quality and sustainability of our work in the Department of School Development in Mölndal, leading the participating researchers to primarily focus on: what encourages inclusiveness in learning activities, success factors and dilemmas.

The local working teams consist of staff from the Support and Development Department, including school developers and the student health staff, as well as psychologists employed at each school. They also had a reference group that consists of managers, scientists, the National Agency for Special Education and head teachers from the participating schools.

Three schools with teams from each unit participated together with the schools' headmasters.

The students from the participating schools ranged from age 7-11.

The Swedish Research Council (*Vetenskapsrådet*) - an agency under the Ministry of Education having a leading role in developing Swedish research - acknowledges peer tutoring and metacognitive strategies as having great effects in terms of achievement of learning goals. They state that a range of

influential factors help increase or decrease the effectiveness of the approach, and their conclusion is that although the current scientific evidence is good, more research is needed on collaborative learning (Vetenskapsrådet, 2015).

6.1.2 Areas of focus and questions

The Swedish project follows the common list of priority recommendation that all partners have followed during the course but they are at bit modified and adapted to the research mentioned above:

- Reflection on the impact of learning
- Formative assessment
- Effective feedback strategies including peer tutoring (and the closely related strategy of cooperative group teaching /learning) and metacognitive strategies
- What success factors or dilemmas can be observed in the teaching and learning regarding evidence-based inclusive strategies?
- What skills or approaches are needed carrying out the strategies?
- Has the course led to changes in education in terms of inclusion?
- How is inclusion being carried out in the different practices (workshops/seminars, classroom observations and follow-up supervision)?

6.1.3 Theories behind recommendations

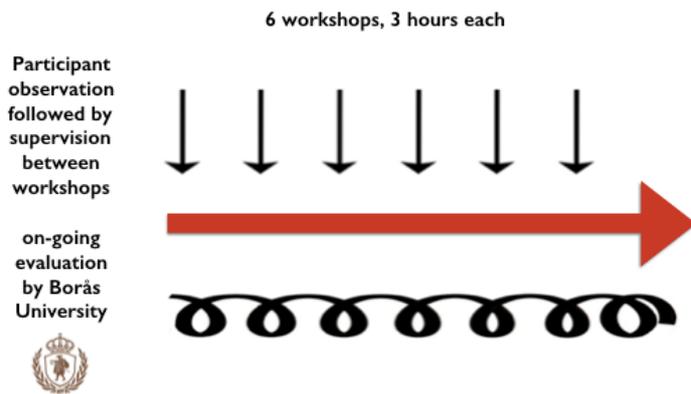
In this chapter we will describe theories of inclusion and how it is related to the Swedish curriculum. It is a broader perspective of inclusion compared to the definition of inclusion related to evidencebased strategies in education, which is the main focus in this project TeachLearn.

6.1.4 Implementation strategies/activities

This project aims to empower teachers to promote inclusive education. Our concept includes for example defining inclusive teaching approaches and empowering teachers through supervision. We think it's important that teachers professional learning is organized so that they have the opportunity to both share experiences meeting in groups and that they share the practice in the classroom as critical friends.

According to our point of view regarding "evidence informed" education we decided upon the following implementation strategies. Below follows an overview of the implementation strategies which is both a topdown and bottom up strategy. It's more of at top down strategy though because there is a common framework for this Erasmusproject.

6.1.5 Overview



The course is designed as a project with six workshops/seminars and one follow-up meeting. All our workshops have been documented by film meaning that we can return to the material in order to reflect upon our work.

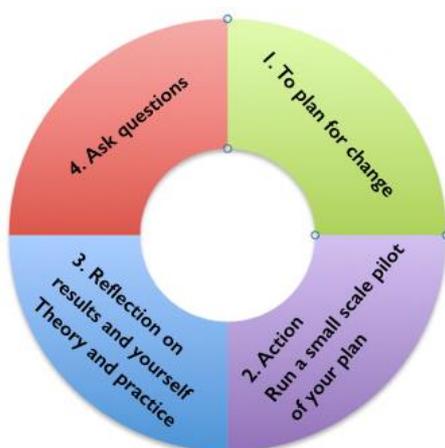
The local working group gathered together with teachers, headmasters and researchers. Each workshop was 3 hours long including presentations, discussions and peer learning/mentoring in small groups. One team from each school was present. The six workshops were carried out over four months. During workshops the teachers work together, discussing and preparing actionplans how to organize lessons focusing on inclusion in particularly peer tutoring and feedback strategies.

Between the workshops the local project team carried out participant observations immediately followed by supervision and facilitation in an actionlearning group. Teachers also acted as one another's critical friends - conducting observations of each other.

An evaluation with a questionnaire was carried out after the six workshops we had a follow up meeting when researchers presented their material and we discussed the results both in the local working team and together with the schools.

The course/project ended with a seventh seminar discussing the process and results both in the course and at the schools. A future project will be based on factors described in this report.

The implementation strategies have the following action-research approach:



ActionResearch or actionlearning is a way of engaging teachers/professionals in collective learning in which the the key is that everybody will practice giving each other feedback and develop effective

meetings focusing on pedagogical matters. Central elements are: asking questions about the practice, staging an action, following the process and reflecting on what takes place there. (Rönnerman 2012). Teachers who are engaged in cycles of effective professional learning take greater responsibility for all students' learning (Timperley, 2008).

A central question that we experienced in an earlier project was: "To what extent does the professional peerlearning effects the education in student groups?" So we wanted to bridge that gap and started to develop participant observations.

6.1.6 Workshops/seminars

During the seminars the schools' teams discussed how they would organize a lesson according to evidencebased strategies for instance peer tutoring. They formulated a so-called actionplan based on the following questions:

- What do we want to develop?
- Why this in particular?
- What do we want to achieve? (Relate to inclusion/ participation)
- What previous personal experience and/or literature could support our work?

Read more in appendix 1.

Hoping to promote school development and aiming to share our insights both within the project and externally, we have employed the use of film. Thus, all six project-seminars as well as the final reflection/evaluation seminar were recorded. These film recordings were then used as the basis for writing this rapport. This generated several different benefits, particularly in terms of reflection and analysis regarding the project's different methods and results.

6.1.7 Participant observations and supervision

The local working team, one schooldeveloper and one psychologist conducted participant observations together with a teacher employed at the school. During the lessons we photographed what was happening in the learning activity.

Field notes were scribbled down on blank paper in the shape of key words – primarily nouns and verbs – and quotes. These observations can therefore be seen as unstructured, without any fixed categories. But we also tried an observation template.

Immediately after the lesson we had group supervision/ professional peer learning focusing on inclusion aspects of the lesson, particularly in terms of students' peer tutoring and co-learning.

The participant observations led to many new questions as you can read about in the result below.

6.1.7.1 Results

The researchers in the project highlight that the course structure – with different stages – is generally positive, as described further below.

Success factors with regards to the project's structure and process according to L. Langelotz and M. Levinsson, Borås University (personal communication 15 april 2016):

- Content in seminars that had relevant scientific underpinnings of the educational initiatives.

- Clear references were made to research on inclusion, peer tutoring, meta-cognition and formative assessment.
- Participants were encouraged to develop a common definition and understanding of inclusion.
- Different definitions of inclusion were highlighted in relation to concepts such as equivalence, accessibility and participation.
- The ambition has been to engage and involve participants in discussion, i.e. not simply talk about inclusion but also make sure to work in an inclusive manner. Examples for discussion were selected from the teachers' daily practice.
- Teachers were supported in their efforts to establish action plans based on their interpretations of the development project's content. Room for interpretation or autonomy is an important aspect in participation. It is important in order to promote motivation and incentive within each and every participant.
- The organisation of the course gave teachers the opportunity to systematically and critically evaluate their teaching practice.

Most of the lessons that were observed focused peer tutoring and formative assessment. Peer tutoring is closely related to the evidencebased strategy "Cooperative Group Teaching (Mitchell, 2014), and during some lessons this strategy was used.

During the observations and the learning conversations thereafter, different questions emerged. These inquiries were documented together with photos from different learning activities, and are listed below under the following categories:



Teach

What do the teaching goals look like in relation to what the students are learning?

Some students immediately forgot their instructions. How do we address this?

In what context is the KWL (know, wish, learn) scheme applicable?

In what ways can one make sure to engage *all* students during class introductions?

In what different ways can one distribute questions around the classroom?

How are the group's social relations promoted and developed?

In what ways are the students' opinions taken into account in order to develop ways of working?

What/whom do teachers need to understand more about?

How can one translate findings to fit the everyday reality outside of school?

Co-teaching

Do we continuously invite colleagues into the classroom?

How can we clarify the different roles for teachers present in the classroom?

It is easier to observe when one has defined the subject area. How do we go about this?

Learning Peer Tutoring

What does the interaction between the students look like?

What kind of skills do we practice when using peer tutoring in connection with the curriculum?

What does the process and the progression in peer tutoring look like?

Should students create similar products/results or different ones? (competitive aspect? Autonomy?)

How can learning activities be adapted (accessibility: physical, pedagogical, social)?

How can students feedback promote inclusion?

The student's need for developed skills

What kind of help does the peer tutor require?

How and when do we talk to the students about the ways in which they help one another?

What roles are the students able to take on in peer tutoring?

How can one learn to work in a group – step by step?

How can the students be involved in setting up common social/communicative goals for the group?

Promoting and creating proven experience

How do we collect the good examples?

What are the ways in which we can use film recording in the classroom as a tool for reflection?

How will we continuously document what happens during development work?

How will we best go about continuously reflecting on the observations

How do we share our experiences with our colleagues?

Observation of lessons followed by supervision

Dilemmas:

At times, the goals for the lesson were identical to the strategy. Instead, the strategies such as peertutoring can be connected to the subject goals, so that the method is not prioritised.

Different ways of defining inclusion leads to different results regarding the evaluation of how inclusive the teaching is.

For example, looking at the teaching from a social perspective to what extent in which the students actively participate in the learning activity – a high degree of participation would result in a positive evaluation of the lesson regarding inclusion. However, if somebody who prioritises didactics in their view on inclusion evaluates the same lesson, the outcome could be the opposite – particularly if the lesson involved a limited extent of inclusion in terms of the students' room for interpretation of the task - i.e. that the task is primarily teacher-led – (autonomy is considered an aspect of participation).

Headmasters opinions and effects in the classroom

Both a headmaster and school psychologists expressed that they had noticed development among teachers in the working teams as well in the classroom. For example, they suggested that the conversations in the working teams had changed significantly and improvement of communication among the students. Previously, the teachers' conversations focused on the ways in which they were going to promote a calm and productive learning environment for the students, encouraging them to focus on their own work. However, during the course, the psychologists noticed a change in

conversation towards discussions about learning – leading the other pieces of the puzzle (such as creating a calm and productive working environment) to ‘simply fall into place by themselves’ as a result of this.

One headmaster consider peer tutoring to be an important approach and working method at the school. The school intends to organise the collegial learning in a clear manner, so that it is obvious how one is to work at school. In the development of this it is important to ‘listen to your teachers as well as establishing clear boundaries. As a headmaster, one can lead by example by inviting a headmaster colleague to take the role as a ‘critical friend’, the headmaster says.

This head also regards inclusion as an important approach in schooling – i.e. ‘having inclusiveness inclusion in the back of your head no matter what you do’. The course have highlighted different definitions that are interesting to keep in mind. We consider observations as an important tool to support further insight into how one organize inclusive education in different contexts. For example, one headmaster says: “in this way, we are able to decide what part of inclusion we are to study before each observation”.

Teachers opinions about the course/project based on an evaluation questionnaire. The following parts have been improved according to teachers comments:

- **Makes teachers more reflexive and confident**
“Encouraged us to reflect upon our work”
“We have had interesting discussions and shared our experiences”
“We think more about why we do as we do”
- **Inclusion has a more prominent role**
“Inclusion has a more prominent role in the planning and evaluation of lessons/learning activities. Increased our awareness of inclusion”.
- **Generate/develop learning environments**
“Co-teaching gives you an opportunity to observe students’ learning. It’s developing for both students and teachers.”
“Previously, we discussed the concept of ‘social competency’ and our experience is that schooling primarily works with values - e.g. right and wrong, people’s equal value etc. We believe that we need to include students to a greater extent in our work with values, both in terms of planning, design and implementation. Furthermore, we need to focus more on work regarding ‘norm-critical’ approaches where we question what is considered ‘normal’ rather than what is considered ‘abnormal’.”
- **Improvement of evidencebased education. (Have a big impact on the learning for all students. Small steps big effect.)**
“We explain the purpose of the lesson.
Goals are known and shared by pupils and teachers.
We are more aware of interaction skills, abilities and linguistic concepts that are required. Providing feedback on students’ progress in different ways.
Knowing how to create a good classroom climate where mistakes are seen as sources for learning (a high degree of acceptance for failure and challenge).
We are more aware of peer tutoring and use it as a strategy”

We are discussing interaction and skills, abilities and linguistic concepts that are required related to peertutoring.

We provide feedback on students' progress in different ways"

The project has made us realize that the five abilities in formative assessment can easily be connected to peer tutoring or cooperative group teaching. We believe that it is important to have the five strategies in mind when planning lessons.

Something, however, we retrospectively reflected upon are the abilities that a student might need to be able to participate in a peer learning. We also feel that we have a common view of the peer learning and how we want to continue our work"

"This project has made us realize that the five abilities mentioned in formative assessment can easily be connected to peer tutoring and cooperative group teaching/learning. We therefore think it is important to include these different abilities when making lesson plans regarding these strategies. For example, use games that promote conceptual discussions (conceptual ability), give the children opportunity to explain to one another (analytical ability, communicative ability and conceptual ability). Help the children see patterns (conceptual ability). Support curiosity, sense of competence and cooperation."

- **Improvement of continuously learning and evaluating lessons**

Analyzing the learning of children with specific educational needs and look for ways to improve the learning.

Teachers express that observation and being observed is overall positive and it has a great potential to develop teaching and learning.

During the course/project we developed a template in order to discuss observations. We have in an earlier projects discovered that teachers needed to define the difference between doing and learning aspects. Therefore the projectmanager created this template. However it is designed in order to be more developed by teachers who are using it. **See appendix 2.**

6.1.8 Analysis; conclusions and practical recommendations

The project has been monitored by "on-going evaluation" researchers that have helped the local working team with the analysis of success factors as well as development opportunities.

The researchers highlight *three areas* of potential development regarding the educational initiative:

- Research that both proves and problematizes – having a more critical approach.

The course has primarily concerned research that proves teaching strategies, e.g. peer tutoring, as positively in line with evidence based research. The local working team has highlighted that the strategies should not be regarded as 'recipes' but need to be adapted to the group of student that the teacher is working with. Questions have also been problematized in connection to the observations, regarding what abilities peer tutoring requires. However, the researchers encourage the working team to take a more critical approach and feature research that proves *and* highlights problems and difficulties within particular areas of knowledge – such as peer tutoring. It is important to be aware of both positive and negative aspects of different educational strategies.

- Clarify what aspect or definition of inclusion that is being referred to, when strategies such as peer tutoring, formative assessment etc. are brought up.

Within the project inclusion was already discussed from many different perspectives, but this can be improved by clearly connecting strategies/ways of working to what perspectives and dimensions that are being referred to. Some of the research used during the course had more to do with teaching in general than inclusion specifically, therefore it is important to discuss this connection. In other words: select studies that explicitly focus on the connection between teaching strategies from a particular definition of inclusion.

- Clarify what different practices the course/project consists of, i.e. seminars, observations and learning conversations/ supervision. Then clarify *how* inclusion 'is made' within these practices.

At one point, an observational template that the working team had developed was used. Its intention was to move focus from the student to the teaching, in relation to the student's participation in learning. See appendix 3. In order to 'make' inclusion in this case, would be for participants to be involved in the development of observational templates. This means that a future course/project also should be extended time-wise in order to fit such a process.

The focus in this project has been to strengthen teachlearn strategies (what, how, why). Furthermore all practices should consider the students meeting with the physical, educational and social learning environment (accessibility). This can be seen as a relational perspective on SpecialNeed Education where different structures/ pre-requisites affect the students participation in learning and community. It is also a matter of relationship between requirements and capabilities.

Additional areas of potential development, based on the researchers' and the local working teams' views:

- Discuss or clarify even more how inclusion is portrayed in the curriculum and the law of school. In the beginning, inclusion was problematized by having teachers divided into groups that used 'brainstorming' to define their thoughts about inclusion. This was thereafter connected to the concepts of equivalenceity, accessibility and participation, by the local working team. Increase time for the participants to discuss inclusion in relation to the curriculum and law of school.
- Discuss the concept of 'learning' related to inclusion.

This part should be included in future course/project – meaning that the course/project needs to be extended. Illeris (2015) three dimensions of learning may be interesting to discuss.

- Practicing observations is needed.

Observation is a tool used to get some distance to one's practice – providing space for reflection around it – but perhaps this tool is not for everyone. If so, there are other tools available, such as writing a journal, self-recording etc. Another discussion that developed regarded the idea of 'opening up one's classroom'. How can this be attempted in different stages? Is it a requirement for all teachers to open up their classrooms? It might be a good idea to specify even more precisely what a critical friend is observing (the teacher, the students' reactions etc.). Another idea raised by one of the teachers was to call this practice something other than an 'observation' - perhaps describing it as something that is part of the daily routine. Are there ways in which we can systematise observations and the work around them? the participants asked themselves.

An observational template was used during an observation (see appendix 1). On another occasion we explored having *aspects of participation* (see appendix 4) visible during the observation to see if this

was helpful. Some people thought it was, others did not but preferred taking field notes on a blank piece of paper instead (using key words - primarily nouns and verbs - and quotes). In this way, our observations can be considered as non-structured without any set categories. The notes/key words were complemented by more comprehensive text written in a journal after the observations on the same day, i.e. a word document on a computer using the method described in Bjørndal (2005). This step was conducted differently by different people within the local working team and ought to be discussed further.

During follow-ups and evaluations of the teaching effort, teachers have highlighted the need to develop their ability to observe their own practice. The researchers of the project emphasise the importance for teachers to discuss and develop observational templates themselves, Primary focus on observation was peer tutoring, formative processes and metacognition. Distinctions can be made even clearer based on the teacher's wishes. It is also important to delimit and clarify what dimension of inclusiveness that is to be observed on each occasion. One teacher calls for further training in how to observe and take fieldnotes.

Demonstration or development of the teaching/ observation facilitated by teamteaching?

During the seminars, teachers planned lessons and formulated action plans (appendix 1). The researchers underlined the importance of everyone – including students - understanding and acknowledging the observations. They also discussed demonstration compared to development of teaching/learning. This brought a type of co-teaching to mind, namely teamteaching. Could it be that there is a distinct difference between on one hand two teachers planning the lesson together and then carrying out the lesson (with one of them responsible for the teaching and the other one assuming the role of observer) and on the other hand one of them as responsible for planning and teaching whilst the other one simply observes? One teacher suggested *“to plan the lesson together but having one of us carry it out (and the other as an observer) makes it less scary to view the lesson since you have already talked through the content of it and then get to evaluate it together...”* This indicates that teamteaching involve a greater extent of cooperative learning and development of education.

More time for reflection in connection with the observations

The project researchers highlight the importance of teachers asking questions that stem from their own practice. This was encouraged during the observational follow-ups in cooperation with the working teams.

The projects researchers believe that the teachers' questions should be paired with research findings and theoretical perspectives. The project's working team also underline the importance of documented proven experience, and that questions connected to pictures taken during the observations should be given more reflection time in the learning groups. During this project, that activity was carried out in a larger group.

A question, raised by a headmaster, regarded the pedagogical leadership: He compared on one hand being part of the learning conversations after an observations and on the other hand being present in the classroom during lessons. The headmaster thinks he learns more about teachers thoughts and practice by listening to their conversation and questions after a lesson. So he is questioning the importance of visiting lessons.

A thought that emerged was to what extent the follow-up conversations differ depending on whether

the headmaster takes part in the conversation or not.

Teachers stressed it is important to document in order to remember, but it is also a dilemma not having enough time doing it.

Process leaders in learning groups

Within previous projects, process leaders abilities have been considered essential in guiding their colleagues during meetings and furthering school development.

In this project, there was not enough time to train people in this role – instead the local working teams' pre-formulated process-questions which were used during work in the learning groups at the seminars. The idea was for these process-questions to provide support for teachers during their discussions and organisation of lessons (action plans).

See appendix 1.

Supervision or facilitation

In one of the schools, we observed a clear progression: the initial conversations were held by an external schooldeveloper and at the last meeting teachers managed it themselves. Again, it is pressing to develop skills as processleader.

Are the follow-up meetings to be considered as supervision, evaluation or facilitation? What is the next step in this process?

Owning your development – autonomy

The content of the project has been delimited though focus areas within the TeachLearn project. Since the working team will be planning new projects in the near future, it is relevant to have a clearer point of departure from the issues that the participating teachers and school leaders have been able to identify in their local practices. This has also been the procedure within previous projects run by Mölndal's school administration. Autonomy/ room for interpretation is an aspect of participation that runs through all levels of the organisation.

Furthermore, it is pressing to make sure to involve the students to a greater extent when it comes to plan future course/project. In addition a greater extent of listening to students thoughts about peer tutoring.

Owning your own development is part of formative assessments described above and this, too, is something that ought to permeate all levels of the organisation – meaning that it is not only applicable to teaching students, but also equally important for professional learning.

6.1.9 Formative assessment, peertutoring and cooperative group teaching/learning

Five strategies of formative assessment

1. Clarifying, sharing, and understanding learning intentions and criteria for success – getting the students to really understand what their classroom experience will be and how their success will be measured.

Practical guidelines:

“Clarify the task ahead for students by starting classroom activities with a definition of goals. Note specific goals on whiteboard. Each student sets individual goals at their ICT-platform Unikum to follow up individually as well as with their teacher and parents.

Each student also figures out how and with what methods they shall reach the goal and how they will demonstrate their learning. There are many different ways of reaching the goals.” (teachers comment).

The objectives should be learning goals as well as common social goals for the group, i.e. clarify expected abilities.

“As a teacher, it is of great importance that we focus on the abilities that we find in the national curriculum for schools. Here are some examples:

-Analytical ability:: Describe causes and consequences. Suggest solutions. Explain and demonstrate the connection. View from the outside and switch between different perspectives. Compare: Similarities and differences, advantages and disadvantages.

-Communicative ability: Converse. Discuss. Motivate. Present. Express ones own opinions and points of view. Put forward and respond to arguments. Describe, formulate, discuss and present findings.

Meta-cognitive ability: Interpret. Value. Have an opinion of. Reflect . Solve problems adapting to a particular situation, purpose or context. Determine plausibility. Choose between different strategies. Test and reconsider.

-Ability to handle information: Seek, collect, structure/sort through and critically evaluate information. Differentiate between facts and values. Determine sources usability and credibility.

-Conceptual ability: Understand the meaning of concepts. Relate concepts to one another. Use concepts in different/new contexts.” (Teachers comment).

2. Engineering effective classroom discussions, activities, and learning tasks that elicit evidence of learning – developing effective classroom instructional strategies that enable the measurement of success.

Practical guidelines:

Note the ways in which questions are asked in the classroom. New and innovative ways are introduced instead of the traditional method: a teacher asks a question and one student answers.

In order to allocate the word to all the students teachers can use several different techniques - such as; cards or ice-cream sticks with students’ names. Teachers pick a card or a stick every time when asking a question.

To promote cooperative group teaching and learning teachers can use methods such as: “C3B4me” which means that a student asks three friends before asking a teacher.

“It is also important to have discussions with the students regarding what abilities that might be needed when working together with others, what different roles one can imagine having in various groups and what they think that ‘cooperation’ means in practice.” (teachers comment).

“Show the students how to collaborate and have daily discussions about norms and values, students as well as teachers.” (Teachers comment).

The traditional method is also questions that the teacher already knows the answers to. (In this way the teachers do not learn about the students learning). Instead the teachers questions should challenge students thinking.

3. Providing feedback that moves learning forward – working with students to provide them with the information they need to better understand problems and solutions.

Practical guidelines:

Using ICT as a tool for feedback both on individual and group-level help learners to define where they are in relation to the goal. Tools as mentimeter.com, googleform and todaysmeet.com collects information that learners need to solve problems and solutions, and that teachers need in order to adapt the education and the feedback to students.

Supportive questions in order to achieve learning "feedforward".

"Two stars and a wish"- identify two things that are good and one that can be improved.

4. Activating learners as instructional resources for one another – getting students involved with each other in discussions and working groups can help improve student learning.

Practical guidelines:

An example of strategy involving peer tutoring and cooperative group teaching/learning:

Think – pair – share

Below you see an example of peer tutoring that can be used in a class. Initially the teacher asks a question and all the students think about the question/problem. They can give their answers for instance on mentimeter.com (using their phone, iPad or computer). The answers can be displayed by a projector and they can discuss the question/problem in pairs. Students have the fellow beside as a peer tutor. After discussions i pairs they give an answer again in mentimeter.com, and maybe it will be the same or different answers. Lastly the teacher(s) and the students continue discussing and sharing the answers and thoughts in the group.

Teachers in the project think this method is very helpful. Teachers can use "mix" instead of "think" in the beginning. Mix means that students move around in the room while they think about the teachers question/problem.

An example of think - pair – share, in classroom:

"We have used and explored peer assessment in several different ways in the classroom. For example, by focusing on problem solving in maths. Here, the students were given a problem that they were instructed to reflect on individually for a couple of minutes in order to thereafter continue working with this problem in pairs, and later in a group.

We always finish the lesson by having some groups present their solution. Thereafter, we discuss the different solutions that have been suggested:

What was your thought process when solving this problem? Are any of these solutions of better quality than the others? If so, how come? What are the ways in which one can use this newly acquired knowledge when solving future problems?" (teachers comment).

Read more about this: <http://www.cal.org/siop/lesson-plans/>

-An example of peer tutoring with coloured cards.

Teacher appoints one or two students as peer tutors during a lesson.

The other students use cards to signal if they need help. See picture below.



"In the beginning of the project each student used four different cards: green card means: OK, red card means: need help from teacher, yellow card means: needs help soon, white card means: need help from peer tutor. After a few lessons the teachers had learned that it was enough with two cards: the red one and the white. They used the cards during math lessons. The students liked to be peer tutors. It has been easy to arrange the students assisting one another as peer tutors during lessons." (teachers comment).

Another example from Swedish language lessons:

"We have been working with writing different texts – both fact and fiction. The students have been instructed to read one another's stories and give feedback. Sometimes we have raffled peers and other times we have intentionally paired up the students. What we have noticed is that the students become more aware of the learning goals. It is very motivating for them to learn from one another, and this makes them more engaged in the learning activity. The first couple of times, we did not have any structure for the students to follow – making it harder for them to conduct 'good' peer tutoring. At that time, the conversations focussed a lot on handwriting and spelling. However, when students were given a structure to follow the conversation focused more on text and they were made more aware of exactly what was expected from them. We have also worked in similar ways in other subjects." (teachers comment).

5. Activating learners as owners of their learning.

Practical guidelines:

Listen to the students opinios in various ways in order to adapt teach/learn activities. For instance use ICT as a tool for learners to establish where they are in relation to their goal.

6.1.10 Evidence-based strategies and skills

- What skills or approach are needed carrying out the strategies?

6.1.11 Next step

Teachers opinions according to a questionnaire:

Professional development

Teachers think it is important to continue and increase time working with participant observations and professional peerlearning, and the whole staff should be involved being one another's critical friends which means that they could modify their actions in the light of the feedback.

In order to do so they mentioned that the structural qualities/ the organizational conditions need to give them time for this work.

The teachers think that they should improve their lessons by guidance through evidencebased strategies and by increasing listening to students' opinions, and they highlight that it is important to practice how to observe lessons.

-Practice:

Teachers think that it is important to define their roles in co-teaching, and they find it easier to observe one another's lessons when they first plan the lesson together and afterwards evaluate the lesson (teamteaching).

The teachers also want to increase opportunities for students to collaborate. Furthermore the teachers are discussing how to organize learning activities such as peertutoring when the students have different languages. They also want to try students' peertutoring with mixed ages.

According to the questionnaire it is important to even more consider how to promote a good balance in teacher/student dialogue in the classroom. Finally, another issue to be considered is group goals (not only individual goals for students) concerning skills needed in the evidencebased strategies.

Headmasters opinions

The next step is to organize learning visits/observations and develop peer learning in the field of programming. Furthermore we will highlight the Swedish language in all subjects and activities which means a design of lessons that address both competences and linguistic needs of learners.

The local working team

The course/project have led to changes in education in terms of inclusion, but as described above there are a lot to be considered when working with evidencebased strategies regarding the effects of inclusion. It is important to have a critical approach and discuss both success factors and risks concerning evidencebased strategies etc.

The local working team will consider all that had been said and done in this course/project in order to continue and develop the design which involves how inclusion is being carried out in the different practices (workshops/seminars, classroom observations and follow-up supervision).

6.2 Case study Tallinna Haridusamet

6.2.1 Background

Tallinn Education Department involved six Tallinn preschools and schools in the TEACH project. The selection criteria were the interest and readiness of the educational institution for the implementation of inclusive methods in their teaching process, also the regional aspect that the schools are situated in different city districts.

Three general education schools - Tallinna Lilleküla Gümnaasium, Tallinna Mustamäe Realgümnaasium, and Tallinna Arte Gümnaasium (students' age group 7-19 years old) and three

preschools/ pre-primary educational institutions - Tallinna Päikesejänku Lasteaed, Tallinna Muinasjutu Lasteaed and Tallinna Lasteaed Päikene (children age group 1,5-7 years old) participated in the project. Each educational institution created the project team which included the management and teachers, in total 4 members. It was important to involve the head and/or head teacher into the team, as the management member has the possibilities to direct different resources for the implementation of inclusive teaching strategies in their school/ preschool. Tallinn Education Department's representatives together with the preschools and schools teams formed the project working group. The teams of educational institutions attended the teacher training sessions. The training was implemented and guided by Tallinn University lecturers PhD Katrin Poom-Valickis and Kaia Köster.

After the training sessions the participating preschools' and schools' teams analysed their strengths and planned improvement activities during their pedagogical meetings. The teachers and management staff of each institution composed their action plans which is based on GROW model and is as a basis for inclusive education activities in the classroom.

Participated preschools and schools organised open teaching activities in their institutions and shared their knowledge and experiences received from the training sessions and from the project partners to the other members of the working group. The participants of TEACH project have introduced their good practices on implementation of evidence based recommendations in the teaching process on city-wide seminars and info days.

Tallinn Education Department will ensure the sustainability of TEACH project through continuing the cooperation on the project topic with the participated preschools and schools, also enlarging the network with new interested educational institutions and providing them the training course on inclusive education theories and good practices in cooperation with Tallinn University in 2016-17 school year.

6.2.2 Theoretical base of TEACH-project training

The theoretical base of the Teach-project training „Implementation of inclusive methods in the educational institutions“ was *self-determination theory* by E.Deci and R.Ryani. According to the self-determination theory the involvement of a learner affects him/ her to an extent how much the individual **psychological basic needs – a need for autonomy, competence, and relatedness** are met. Meeting these three basic needs is necessary precondition that persons are acting as self-managing individuals. Teacher can create conditions that support and take care of psychological needs of learners or vice versa ignore them.

According to the self-determination theory the social environment can support the motivation of individual, also support that the needs of individual for autonomy, competence, and relatedness are met – the need for feeling about itself as initiator of own behaviour, capability to manage situation and feel relatedness with the others (Ryan & Deci, 2000, 2002).

The first session of the training focused on mapping of the features of the learner-centred school/preschool and its linkage to the self-determination theory. Subsequently on one psychological basic need and its supporting opportunities were concentrated. We started with the topic of relatedness that is the basis for creation of positive and inclusive learning environment. Yli-Luoma (1996) brings Bowlby (1988) *attachment relationship theory* into the learning context and explains that without safe teacher-student and student-student relationship the students are not motivated to learn but concentrate on their social relationships. Therefore the socially and emotionally safe environment

and meeting the needs of relatedness are the precondition for learning and learning motivation. Additional training topics were group dynamics (Truckman 1965) and the role of teacher creating cooperative teams, communication levels (Berne 2001), relationships and social skills (McKay, 2004).

The second session of the training focused on supporting autonomy and mainly teaching/ guiding style of teacher. The focus was on two aspects of teacher's teaching style that significantly have an impact on the students' involvement – supporting autonomy (versus control) and structuring (versus chaos). If teacher supports the students' autonomy (interests, needs, preferences, personal goals) and offers them interesting and relevant teaching methods, optimal challenges and points out the learning aims then it will increase the students' involvement (Jang, Reeve & Deci, 2010).

Structuring helps to create learning environment where clear and argued expectations are set for learners, where guidance for learning support and feedback are offered. These things are important to support the learners' concentration to their learning tasks, to regulate behaviour and to avoid the chaos arisen while moving from one activity to another in the teaching process (Jang et al, 2010).

We were handling the topics like taking care of the inner motivation sources, explaining the values of the activities, choices and responsibility in the learning process, importance of questions and dialogue, guidance, noticing and recognition, use of non-controlling language, acceptance of learner's feelings and listening skills. In addition, participants had the opportunity to analyse their teaching and guidance style and get feedback from their students how they feel that the teacher creates autonomy supportive learning environment. Students' questionnaire also included the questions about the learner's beliefs on his/ her capability (*theory of intelligence*).

The third session of the training focused on supporting the competence. To meet the need for competence it requires offering the right challenge in the learning process, incl. differentiation according to the learner's capability, needs and interests. This means that at first the teacher should know his/ her students well. The results gathered from the research were analysed and ideas were generated what can be done in the learning process that the needs of different learners would be more supported. Teachers' strengths and these implementation possibilities were analysed (VIA-character strengths, Seligman and Peterson, 2004). It was discussed which are the opportunities to get to know the strengths and needs of the students. Based on the theory of intelligence (Dweck, 2006; *theory of intelligence - growth and fixed mindset*) it was learned how to give feedback in order to support the development of the student instead of only praising him/ her.

It was discussed about the problems and opportunities of the *formative assessment/assessment for learning*. The ideas were shared how teacher can better support the learner's learning process. Additional topics were individualisation, reflection and supporting the learning skills. The training ended with the planning of the schools/ preschools' teams activities based on GROW model (Whitmore, 1992) and with the aspects learnt from the reflection (Korthagen, 2004; de Bono, 2009).

During the training session the participants' activeness were supported via different methods, games and exercises, dialogue and cooperation and the principle of learning from each other.

6.2.3 Summary of Tallinn educational institutions' action plans

Goal

- Teachers are socially competent and tolerant while learning from each other (teacher from teacher and children/ students from children/ students); teachers and children/ students understand the differences of the others and consider them in their attitudes.
- Children/ students and parents are involved in the learning and educating process by different

means on cooperation.

- Supporting autonomy of the children/ students and the teachers and noticing and recognizing each other.

Reality

- Teachers and head teacher participated in the TEACH-project training. All received encouragement from the training and motivation to act for a common goal.
- The content of the training, the concept and the goals are passed on to all staff. It is jointly agreed that hereafter it is important to support autonomy and give recognition of all children/ students and staff.
- Activities that support the basic psychological needs have been analysed and strengths and improvements have been developed.
- Preschools and schools have taken the opportunity to link the theme of the training and the study theme of the school year of the institution with the series of traditional events, pedagogical working groups and the thematic meetings. We have to find more positive in ourselves and others that need to be noticed and recognized.

6.2.3.1 Option 1

To provide and enable options for the staff and for the children/ students who are participating in the learning process.

In order to have as many different options as possible it is necessary to enable both the staff and the children/ students to express an opinion on the activities and decisions.

Examples:

- Involving children when giving feedback and self-evaluation. Teachers say that they are now providing significantly more freedom of choice for kids in art activities. The child is free to choose the colors (colors choice does not have to fall together with an actual object color). It is just important that children are able to justify their choice and express themselves freely both artistically and linguistically). In artistic activities children are free to choose the colors and the characters; the main thing is that it would be relevant to the topic. Children can also choose the places where the activities take place (bedroom or a study room). A child, who has a birthday, has the opportunity to choose where to celebrate his/her birthday (indoors/outdoors).
- Conducting educational activities for children we started to offer more choices. The teacher has several educational games and art activities related to the weekly theme, but ask the children for their opinion. If children can choose they are more interested in the activities and also responsible for the completion of activities.
- Daily activities are divided into the centres and the child can choose a specific time frame in which it performs the activity – weekly theme related educational board games and art activities. Children themselves will choose in which order they would like to do the activities. We also use autonomy in the games, the children choose what game they would like to play, and they choose the toys. They make the choice when they would like to hear the teacher reading the story (before modeling, drawing and painting or at the same time).
- During the dividing of children into the groups or pairs we use play cards (e.g. all hearts make one group) or ribbons (the teacher will hold the ribbon from the middle, children will choose one end of the ribbon, children who had chosen the same ribbon make a pair).
- Preschool has a series of traditional events but none is set in stone. The teachers' wishes and opinions are listened. If a teacher has a new idea, it is considered and added, if everyone agrees.

(e.g. book fair to celebrate the day of our Mother Tongue).

- To do a brainstorm with children to find stories about the new school year and find stories about the school year with the parents. Ask children about their wishes (e.g. make thought cards), consider the wishes of the children, connection to the main theme of the school year. We enrich our daily activities because we have a lot to learn from each other – we enjoy working together.
- Reflection of the emotions. Often we can help children by reflecting their emotions. Mostly, children are able to solve problems between themselves, but when it seems that they cannot cope anymore we should step in and help them. For example, we can make a proposal to help them play another game. We should be reflecting what is happening. Talk to them and listen to them. We can also reflect the emotions to help to solve the problems/ misunderstandings. Developing empathy through trying to understand what the other child feels in concrete situation.

6.2.3.2 Option 2

To increase the sense of belonging, to increase the mutual respect to each other and to develop greater tolerance for expressing the simple forms of communication in daily activities, learn to live together.

Preschool is committed to cultivate a sense of belonging and unity through different joint events – with the team, with children, with parents and grandparents. If the whole family is involved in the child’s education and all feel as a large family, then “your concern is my concern”.

Examples:

- If the family brings their kid to preschool in the autumn, there will be carried out family conversations (between the parents and the teachers) so that every family should feel that they are important. It also establishes the basis for a relationship of confidence between the family and the preschool. Every spring, there are meetings with parents and teachers to discuss the development of the kids’ education and also just to get parents involved.
- Preschool’s joint celebrations (celebrating the autumn, Valentine's Day Carnival, Independence Day etcetera). To reduce the mentality of "my children and your children," and "my teacher, and your teacher" by common celebrations where all groups/ classes are equally involved.
- Charity fairs are a good opportunity for parents to contribute to the development and the reputation of the preschool. Money that is collected is used for organising a trip into the nature in spring. Parents are invited.
- Based on the teacher training and the materials we got an idea to create a Friend's Bench into our preschool outdoor area. Friend's Bench idea is that a child, who does not have a friend to play with, will sit on a bench. Others who see a child sitting on a bench understand that he/she is looking for a playmate and they will invite him/her to play with them.
<https://www.facebook.com/CBCSaskatoon/videos/1137617822950359/>
- Reflecting the emotions between staff in their mutual relations, trying to understand each other and find suitable solutions for everyone. For example, choosing the friend of the year among colleagues.
- Make everyday activities visible for parents (e.g. video clips, photos in the blog)
- Involve parents whose native language is not Estonian into the learning and educational processes by introducing their national culture
- Using preventive methodology “Free of bullying!” which is aimed at creating inclusive relationship between children and teachers, behavioural culture in the class to prevent bullying by ensuring respect and tolerance towards each other, where children care about each other and, when

witnessing the bullying stand up for those who cannot do it for themselves.
<http://kiusamisestvabaks.ee/about-us>

- Applying Persona Dolls methodology in classes. Dolls and their stories develop children's empathy and they are encouraged to react and stand for themselves whenever they witness injustice or prejudice attitudes. Originally the dolls were made of cardboard which later will be replaced by special dolls. Every doll has its own profile, personality and story which are based on children's experience. <http://www.suitsupaasupesa.ee/persona-dolls-methodology>

6.2.3.3 Option 3

To recognise and give feedback – it is collectively agreed, that if you notice something positive, you will not keep it to yourself.

Examples:

- At the end of each work meeting every staff member writes on a piece of colored paper (color has a positive effect) something good, she has noticed in the working environment during the previous week. It can be a compliment for someone, or just something nice she has noticed during workdays.
- Task allocation considering staff and children interests, skills and talents. For example, the art loving people are trusted to decorate the rooms, plant lovers can take care of the plants, a person with good listening skills are in the role of the trustee etc.
- Meetings in a playful atmosphere.
Playing games and giving game demonstration that can be used as icebreakers in different meetings and educational activities (e.g. Story cubes).
Each employee writes a professional skill or something else common to that person on a paper (for every co- worker), which will be completed in characterizing Valentine's Day card to a colleague. Nice way to thank and give feedback to one another.

Will

- Provide daily choices regarding bigger and smaller issues.
- Ask children/ students about their wishes and consider the wishes of the children/ students
- Seek and find opportunities for recognition of the children/ students and staff
- Increase the sense of belongingness through involvement of each individual by seeking their ideas and opinions and by making things together
- Our goal is that every member of the staff, child/ student and family feels needed, special and important
- Involve children/ students when giving feedback
- Explain the children/ students, why we study, why we do the things what we do (e.g. connections to everyday life, bring in every day topics)
- Involve parents at class meetings and events by different playful activities
- Implement playful development games in analysis the development of a child/ student
- Using different methodology to increase the autonomy. I.e. children themselves will choose in which order they would like to do the activities. We also use autonomy in the games, the children choose what game they would like to play, and they choose the toys/tools.

6.2.4 Examples of general education school teacher's action plan

6.2.4.1 Goal: bigger independence of students in doing necessary homework

One important component of success in mathematics is exercising. It's not enough when a student gets the understanding of the subject. The difference from ordinary homework lies in student's independent judgement over their need for extra exercises before a test or an exam. Some students need more extra exercises than others, so it would be better for everybody if they can choose the amount of exercises that fits them the best. More developed habit of independent exercising gives a teacher the possibility to give students some figure-tests to do at home from time to time.

Target is completed, if there aren't any more students, who aren't capable of exercising math independently.

Reality

- There are students, who aren't capable of motivating themselves for independent exercising
- Independent exercising requires capability of planning your time and this is a skill which needs to be taught for some students
- There is no support from some students' parents.

Options

- Every time when independent exercises are due I have a discussion and analysis – what was difficult, what could have been different, why weren't the exercises done or why were there too few exercises done.
- Always give answers for exercises so that students themselves can automatically get feedback about their math skills.
- Contact the parents for support, if I as a teacher can't persuade or motivate students to get them exercising independently.

Will

- It's important to try to reach some kind of agreement with students who still haven't done any independent exercising.
- Contact parents to ask their support

6.2.4.2 Goal: increased usage of smartphones and learning apps in learning activities

Nowadays we have a lot of learning apps which we can use in our lesson. Learning apps help to increase students' emotional attachment to subjects, which increases their interest in a subject. Increased interest in learning helps to achieve better test scores. I will consider my target achieved if I use learning apps twice a week in my math classes.

Options

Today's situation is that the usage of learning apps is very random. It depends a lot on teachers' knowledge and willingness to use learning apps in their lessons. Fortunately there is one big supportive factor for learning apps and this is students' big willingness to use them. A teacher might find that it takes a lot of extra time to create digital extra materials for students.

A short list of learning apps which to use in lessons:

- Lucky wheel

There is from time to times arguing from students when asked to answer in front of class like: "why me?", or "I was just recently asked, why again?". Our teachers' experience has been that when a student's name is picked by a digital lucky wheel, they fully accept it.

- TeamUp

A task that often stirs up disputes and protests is organising students into groups. Our school experience has been, that using this app TeamUp which randomly organizes students into the groups, is fully accepted by students.

- Kahoot

Kahoot helps to get a really quick overview of students' knowledge on various subjects. Kahoot allows creating quizzes with several answer options. Students have to choose the right one. The Kahoot programs show the number of right and wrong answers, which gives feedback to the teacher about shortfalls in students' knowledges in subjects. Students will get points for right answers and for speed in choosing the right answer.

- Golden Fleece

This learning app helps to repeat previous subjects with students. Golden Fleece can make repeating process very emotional if students are divided into groups which compete with each other.

Reality

There are already a lot of free digital teaching materials on the internet. All that is needed to do is to search it.

Will

At first teachers themselves must have an overview of learning apps which to use in lessons and they must also know how to use them. Good skills in using learning apps give teachers the motivation to use them in planning the learning processes. At our school there is a hired digital technology expert who from time to time gives teachers free lessons about new learning apps.

6.2.4.3 Goal: increased inclusion of students in issues which concern school life

School is a place where students spend a lot of years so it would be good if they could have their voice heard in matters where it is reasonable. This target could be considered accomplished when students' opinions are always asked in matters where it is reasonable.

The problem can be, that depending on matter, it might not be comfortable and easy for teachers to ask students' options. Let's take one example from our school.

Options

I will give here an example of a situation where it took some organising to get students' opinion on one school life matter. Our teacher of arts who also participated in TEACH project asked students' thoughts about the new statue for school's 40th anniversary. It all took place like this:

- At first students moved around in search for the best place for the statue
- Then students proposed ideas for new statue (is it a sculpture, painting, high relief)
- Then students thought about the size of sculpture and materials
- Then they have completed their concepts
- And the last part was the exhibition of concepts. The best concepts were used to develop further.

The problem is that this all takes a lot of time from teachers and needs a lot of organising.

Reality

If a good example of inclusion of students in planning school life takes place at school, it should be introduced to other teachers as well. This could encourage other teachers to follow.

6.2.5 Games for learning activities

- True or false – good game for language study, e.g. have you ever worn heels? (who hasn't, falls out of the game).

- Everybody stands in a circle - Giving rhythm back and forth e.g. pressure step with your left leg and giving it forward with your right leg, rhythm can be slowed or quickened, the direction can be changed.
- Finding somebody, who shares the same thought as you, everybody stands in a circle, someone steps into the middle of the circle and expresses their thought e.g. I like coffee, who shares the same thought, also steps into the middle.
- Cards with pictures – relate to the present (what’s learned).
- What have I never done in my life – 10 lives.
- Repeating names in a circle.
- Adjective that starts with the first letter of your first name.
- Alphabetical order.
- Find someone who – Meet with the people in the room, introduce yourself and read a statement that you think fits the person. If the person agrees with what you think describes him/her, write their name in a heading behind the statement, if they disagree, write a cross. Seek contact with as many people as you can. E.g. u prefer to work in a group, you are a good listener, you like challenges, you know a lot of stories about art history.
- Task: Even number on people. Find yourself 1 partner. Now imagine there is a river between you. You are on one side and your partner is on the other side of the river. Now try to get your partner to where you are standing.
- Read - Line up on this end of the spectrum if you have no experience, and other end if you have many years of experience. People place themselves on the spectrum wherever they feel it is appropriate-they may need to chat to each other to decide where they fit. (*Fox*)
- Mirror- Players count into teams of two players. One player becomes A, the other B. A faces B. B is person who is looking in a mirror. A is person`s image in the mirror. A reflects all movements initiated by B. After a time, positions are reversed. (*Spolin*)
- Each player says his or her name and then creates a movement. The group repeats the name and movement. (*Fox*)
- Choosing your place from right to left (in the ranking, either like or do not like).
- Children are in the circle. Children say one by one various arguments which they themselves have agreed (eg. "Today is a beautiful day") and then step to the center of the circle. All of the other children, who agree with the statement, also step in the center of the circle.
- Children use their thumb to show their reaction about right or wrong answers (thumb up - right, thumb down - wrong). In the same way they describe their mood (good or bad).
- By divided children into the groups or pairs we use play cards (eg. All hearts make one group) and ribbons (the teacher will hold the laces from the middle, children will choose one end of the ribbon, children who had chosen the same ribbon make a pair).
- Read - Line up on this end of the spectrum if you have no experience, and other end if you have many years of experience. People place themselves on the spectrum wherever.
- Rory`s Story Cubes.
- Thinking Hats.

6.3 Case study TOPunt Gent

6.3.1 Content

Within the TEACH-project in Gent we chose to implement the evidence based strategies through a teacher course. In this course we experimented and shared good practices with evidence based education with school teams and their support system.

The content of our course was shaped by four major themes, namely:

- What has a big impact on learning according to international research? What are evidence based teaching strategies?
- How do pupils learn and how do we make learning visible in the classroom?
- What is effective feedback and how to apply it in practise? (Feedback, feed up, feedforward, levels of feedback and mindset)
- How can formative and dynamic assessment contribute to improved learning performance of pupils?

6.3.2 Setup of the course

The different topics were being addressed during four sessions who took place over a period of two months.

We selected five schools to participate in our course. The schools were recruited from the three types of educational institutions: government-provided education, subsidized public schools and subsidized free schools (often Catholic schools). The participating schools were deliberately a mix of primary and secondary schools.

The school teams that participated consisted of a teacher, a principal, a support teacher, a member from the pupil guidance centre and pedagogical guidance centre. The group of participants was small enough to provide opportunity for interaction as well as big enough for school teams to have a significant exchange of experiences with other school teams.

The setup of each session consisted of discussing the goals of today's session, theory on the topic addressed in the given session, exercises in groups, exchange of good practises/experiences, interaction and evaluation of the session. We tried to follow the principle 'teach as you preach' as much as possible. That's why for instance we always started the new session by discussing our goals of the session and referred to them during the session. The participants picked up on that and teachers stressed afterwards the importance of goalsetting at the beginning of their lessons. To activate the participants between the sessions, a homework assignment was given in between the sessions. Each session started with a reflection and feedback on that homework assignment (how did it go, what did they experiment with, how did they involve the colleagues, what was the result, ...?). The aim was to transfer as much as possible what has been discussed in the sessions to the classroom and to the colleagues. Teaching strategies were experimented on and colleagues were involved through staff meetings, sharing good practices, ...

6.3.3 Content of each session

6.3.3.1 Session 1: What has a big impact on learning?

We first introduced the TEACH-project to the participants, our motivation for our course and our implementation strategy. In this session we looked at what according to international research has a big impact on learning. We introduced the school teams in several research findings, we discussed how to interpret effect size, which teaching strategies have big effect on learning achievement and why and we brainstormed on evidence based education in our practice. The school teams were introduced to evidence based teaching strategies and reflected on their own knowledge, attitude and skills.

We did an exercise in smaller groups. Each group was asked to identify from a list which strategies they

thought had a low, medium or high impact on learning. This resulted in an exchange of which of these strategies they already implement in their own classroom and which strategies they wanted to explore further.

At the end of the session we asked the participants to transfer the input and the exercises on impact on learning to the staff of their own school. They also elaborate which strategies that could be enhanced in their own school setting.

6.3.3.2 Session 2: How do pupils learn and how do we make learning visible?

In this second session we looked at the process of learning and how to stimulate the learning process. According to theory of learning new information is better processed when linked to earlier knowledge. Therefore we activated earlier learning by doing a brainstorm on the characteristics of an effective learning pupil. Through the presented theory we wanted the participants to reflect on the following questions: What is an efficiently learning pupil? What learning strategies do they need to complete a task? How can we make the learning that is happening visible? How can we involve pupils in their own learning process? How can we see where the pupil currently is in his learning process and where he needs to go next? We reflected on how the learning process is made visible in our classrooms and our schools.

Example 1: In order to make the pupils owner of their own learning process a secondary school used a self-evaluation template that pupils filled in after a test. Through this self-evaluation, the pupils were stimulated to think about their own process of learning and their performance on the test.

Example 2: In a primary school the teachers introduced child-meetings, before organizing parent-meetings. In this 1-on-1 interaction the pupils were stimulated to reflect on their own progress, learning goals and general development.

Example 3: In a video made by a participant of the course we see an example of making learning visible. A pupil explains which steps he uses to solve a difficult calculation: "I think, I plan, I do it and I check it."

6.3.3.3 Session 3: What is effective feedback and how to apply it?

A more concrete elaboration of an evidence based strategy was the subject of our third session. We tried to define what effective feedback means and how to apply it in practice. The definition of feedback, the different components and levels of feedback, who gives feedback, the context and how it is received are only a few topics that were discussed in this third session. We also introduced the theory of fixed and growth mind-set from Carol Dweck.

As an exercise the participants critically evaluated a piece of their own written feedback (test, report card, ...). This exercise had two goals. First this gave information on how the teacher gives feedback to the pupil. Secondly the performance of the pupils on the test gives feedback from the pupils to the teacher in order to adapt his/her teaching strategies.

Often the written feedback didn't seem specific enough or was too person-oriented (e.g. "You can do better!") and teachers reflected they missed process-levelled feedback. A consequence of this exercise was that teachers also analysed the questions of the test. By analysing the answers, the teacher remarked that the formulation of the questions wasn't always clear. The teacher involved their pupils in the process of improving the quality of formulation in questions. As a homework assignment participants were asked to make an observation of all the feedback that has been given during a lesson.

Example 1: Teachers noticed the importance of setting clear goals at the beginning of the lesson. And to refer at the end of the lesson to the goals that were achieved.

Example 2: In one school they organized feedback-meetings with the pupil, teacher and support teacher. The pupil was given some questions to prepare for the meeting. That way the feedback meeting was well structured. The pupil was able, not only to receive, but also to give feedback on his own learning process. We saw that the motivation and pupil-teacher relation was strengthened – which has also big positive impact on learning.

Example 3: By implementing the theory on feedback in her own classroom a teacher noticed that a lot of time was wasted on correcting and writing feedback on tests herself. Instead she realised that when pupils corrected and gave feedback on each other's tests they learned more, were more activated and motivated to use the feedback.

6.3.3.4 **Session 4: How can dynamic assessment contribute to the learning performance?**

In the final session we wanted to explore how formative and dynamic assessment can contribute to improved learning performance of pupils. First the differences between summative and formative assessment were illustrated. The basic principles of dynamic assessment were explained and examples were given how to put it into practice as a counsellor or as a teacher to estimate the learning potential of pupils.

6.3.4 **Evaluation of the course**

To evaluate our course we developed a questionnaire that the participants filled in before and after the course. Through this pre- and post-measurement we wanted to establish if there was a change in their levels of knowledge, attitude and skills towards evidence based education compared to the beginning of the course.

To evaluate the different sessions we developed a second questionnaire which the participants filled in after each course. At the end of the last session we held an open evaluative talk with the group about the course and its content and implementation. To know what the effect of the course was on longer term, we held evaluation interviews with the different school teams a couple of months after the last session.

The participants showed a higher score on all the topics on the questionnaire after the course was completed in comparison to the pre-evaluation. In summary, from the evaluation questionnaire after each session and a more open evaluation of the course after the last session, participants liked:

- The good balance between theory and practice, exercises, exchange in group;
- The interaction with colleagues from other schools/learning from each other;
- The diverse group composition (primary – secondary together, teachers-principals-student guidance counsellors);
- The confidential atmosphere;
- Experimenting with different strategies;
- The content: what works best, effective feedback, making learning visible, evidence based education;
- The less is more principle (focus on strategies with small cost and large learning effect);
- Being triggered to try things out;
- The inspirational examples, concrete materials and tools;
- The variation in and enthusiasm of speakers;
- The follow-up and the given feedback on the previous session and homework;
- Setting goals at the beginning of each session.

The participants still identified some challenges, such as the transfer of what has been learnt to the entire school team and obtain a change in vision; how to create a climate where one embraces innovations and is not afraid of change; how to stimulate more teachers to reflect on their own teaching practice, open up their classroom and share experiences with colleagues; how to facilitate the implementation of concrete evidence based strategies?

From the follow-up evaluation after a few months we learned that all the participants considered the teacher course as very positive and would like to have follow-up sessions. They would highly recommend the course to other schools. Every school team stressed the benefit of learning from each other across educational levels (primary and secondary schools together) and educational institutions. The schools who participated want to continue experimenting with evidence based education, especially with impact on learning, making learning visible and effective feedback.

6.4 Case study Universidad de Granada

6.4.1 Course content

- Module 1: Intervention in literacy skills from practice based on evidence
READING COMPREHENSION: Primary school (3rd-6th grade): (a) Development of reading comprehension skills: effective measures to promote and improve; (b) Detection and intervention of difficulties: effective measures derived from evidence-based practice and propose an intervention program; (c) Motivation towards literacy : how to motivate the students and how to prevent discouragement from evidence-based practice.

- Module 2: Introduction to Dynamic Assessment and Cognitive Education
 - Introduction to the evaluation of learning potential and cognitive education.
 - Methodology to implement the learning potential assessment.
 - Proposals to apply the learning potential in the classroom:
 - Increasing learning through evaluation Learning Potential (Lauchlan and Carrigan, 2013).
 - How to implement a mediational strategy in the classroom? (Calero, García-Martín and Gómez-Gómez, 2007).

- Module 3: Behavior Management in Schools. Evidence –based resources
INTRODUCTION TO BEHAVIORAL APPROACH IN SCHOOL: (a) Positive and preventive behavioral approaches; (b) Contingency management and feedback; (c) Antecedents interventions; (d) Instructional approach.

PRACTICAL CLASSROOM RESOURCES: (a) Antecedent-based interventions; (b) Feedback; (c) Individual and group-oriented contingencies in classroom; (d) Daily Report Cards: home-based consequences for classroom behavior; (e) Positive behavioral supports; (f) Organizational skills training.

6.4.2 Implementation strategy:

- 2 sessions / module
- 18 attended work hours and 12 non-attended work hours
- Web based homework between modules: activities and case studies.
- Course target group and number of participants:
 - Primary school teachers (from 16 schools in Granada).
 - Participants were recruited through the CEP-GRANADA (Teachers Centre) of the Department of Education (Granada, Andalusia):
<http://educacionadistancia.juntadeandalucia.es/profesorado/enrol/index.php?id=2028>
- Number and dates of the sessions:
 - 6 sessions (December 12th, 2015; December 10th, 2015; January 20th, 2016; January 27th, 2016; February 17th, 2016; February 24th, 2016)
- Work through Platform: completion platform in March 31st, 2016

6.4.3 Evaluation

- Summary of the results of the joint questionnaires (participants reflection before the course and reflection after the course):
Participants showed higher results in the ending-module questionnaire, compared to the one performed at the starting point. An important result of the course was that participants realize their school-practice did not reflect what the evidence shows to work best. They informed that the courses helped improving their knowledge about evidence-based teaching methods (I know the evidence about what works best).
- Summary of the evaluation and recommendations for further implementation:
 - Participants in Granada showed to need more knowledge and instruction regarding learning processes in children with specific educational needs, as well as evidence based learning strategies (i.e. feedback).
 - At the beginning of the course, participants considered they know how to create a good classroom climate in which “mistakes are seen as sources for learning”. However, after the course termination, they were aware that they knew less than they thought once. We consider this point as crucial regarding the course – it reflects the need of a better and more specific instruction in these topics for the future.
 - For many of the participants being able to get a good classroom climate was a challenge, and they felt unable to get it. After the course they got knowledge about evidence based strategies based on behavioral techniques. They highly valued these techniques and even demanded more information about them, as well as future courses on this specific topic.
 - Participants highly appreciated instruction on strategies for student motivation.
 - Participants highly appreciated instruction on dynamic assessment as totally innovative and useful. Most of them hardly knew about it before.
 - Participants highly appreciated instruction on intervention in reading difficulties, as those are one of the most frequent problems they have to face in everyday practice at the classroom.
 - Overall, the course was highly and positively valued – all contents, methodology, expert-speakers.
- Challenges:
 - Difficulties for applying some of the strategies in the classroom, taking into account the high number of pupils per classroom.
 - Concerns regarding how to pay adequate individualized attention to pupils with more needs.
 - Course impact seems to be too limited, as not all teachers were allowed to attend it (the organization implied a limit).

- There is still not enough research regarding evidence-based practices to be applied in the classroom.
- Evaluation meeting:
 - Participants valued the course as very positive.
 - Concepts like evidence-based education and impact of learning are still very unknown and innovative.
 - A clear interest in developing and



Example of teachers peer learning in groups

- Appoint a moderator and a secretary

1. Formulate an 'action plan' for a lesson

Focus on collaborative learning/ metacognition and skills required for cooperation and feedback.

Document your process/thoughts/answers to the following questions on the website:
<http://www.skolutvecklingmolndal.net>

What do we want to develop?

Why this in particular?

What do we want to achieve? (Relate to inclusion/ participation)

What previous personal experience and/or literature could support our work?

What are we going to do to reach an improvement? (E.g. collaborative learning; where, when, how long, with whom)

What are the subtasks?

Who does what?

When are the subtasks to be completed?

When is the action to be carried out? Decide on a date for observation / learning visit.

2. Start formulating a text about the development work that can be published on the website.

Describe how the development work regards both more generally and more specifically (at the school in question).

3. Wrap up with a conversation about the discussion in the "learning group" (make sure all members get to share their thoughts)

- How efficiently has the group been collaborating today?

Not efficiently at all Somewhat efficiently Very efficiently Extremely efficiently

- Suggest at least one improvement for the group to implement next time.

Appendix 2. Participant observation and supervision



TeachLearn inclusion April 2016

Purpose: To carry out a 'learning visit' at a colleague, focusing on inclusive approaches (collaborative learning/ metacognition)

1. **Ask** the teacher leading the lesson what he/she would like to get feedback on more specifically.

2. Carry out the participant observation

Focus on what happens in the teaching, which means student participation relating to teaching conditions (activity and learning environment). Does the way of working promote student's participation? Take note of successfactors and dilemmas.

3. Supervision: Commit time after the observation for 'learning conversations' (Template below)

The Observer/ critical friend says:

- This is what I have seen/heard (descriptive observation and interpretation)
- I liked the following...
- I wonder about the following... (ask questions)

4. The teacher that held the lesson together with a teachers team reflects over the feedback.

5. Summarize by formulating next step.

a. <i>(Descriptive narrative)</i>	Done <i>(Interpretation)</i>	b. <i>(Interpretation)</i>	Learned	c. Next step?
I noted that...was done...was said... by... ...which led to...	I interpret this in the following way... Which could mean that ... (the student, the teacher, the teaching...) I see connections here with ... (curriculum, literature, similar experiences, inclusion etc)	The teaching could be developed in terms of: - involving students - conditions, structure, learning environment etc. - process (the teaching activity) - results What do you need to research further/ learn more about?		
What happened when...?	What do you think went well and what did not go well?	What do you think about...?		
How did you feel when...?	Why do you do as you do? What alternative ways and possibilities do you see?	What is your next step? What are you going to do?		
	Describe success factors and dilemmas regarding peer-/collaborative learning .	Who can give you support regarding... ?		

Template by Gunilla Almgren Bäck

Appendix 3. Observation template



Mölnåls stad

TeachLearn

November 2015

Activity observation (peer tutoring)

Place focus on what happens during the teaching, i.e. the student's/students' participation in learning in relation to the teaching.

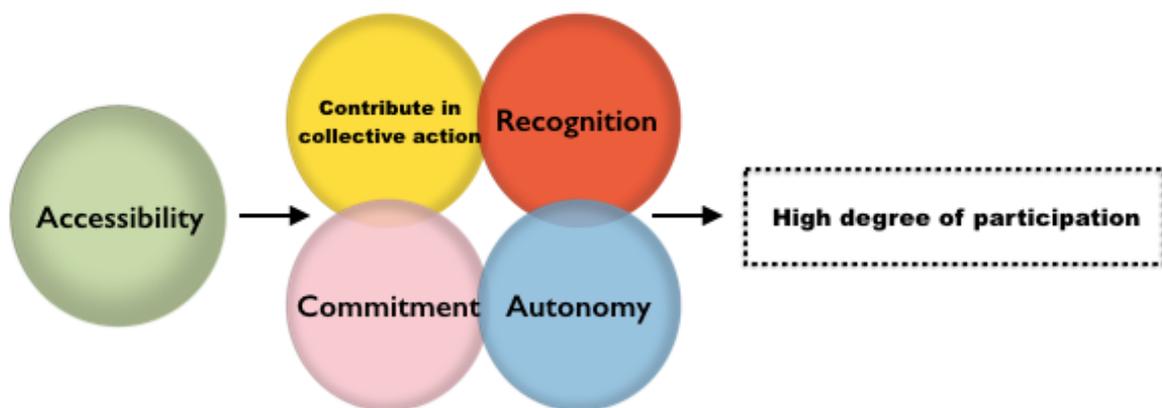
Study the ways in which peer tutoring is portrayed in the learning activity.

Questions:

- What success factors and dilemmas can be observed in the learning activity? Relate to inclusion.
- How does the teacher help the students in helping one another? (Prerequisites)

Theme: Peer tutoring and inclusion	What happens during the learning activity? (key words – nouns and verbs)
The student's participation in learning:	

Appendix 4. Aspects of participation



Participation: students' influence on decision-making, students' participation in learning activities and students' own thoughts about their situation in school.

Digital illustration translated freely by: Gunilla Almgren Bäck

/National Agency
for Special Education and Schools
Sweden

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