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Toward A Theoretical Model Of Inclusive Teaching Strategies -An Action Research In An Inclusive Elementary Class

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Abstract

Inclusion at school can be seen constituting of small but significant issues, such as the participation in the learning community, the experiences of success, and studying and playing together with classmates. An instruction strategy which takes into consideration pupils? different learning phases and aims to their participation was constructed in this research. As a theoretical framework, the Universal Design for Instruction (UDI) and Vygotsky?s zone of proximal development was applied. The study method was collaborative action research. The teacher-researcher collected the data during mathematics and mother tongue lessons in an inclusive elementary class and the study was a part of a large empiric development project that aimed at combining the knowledge and know-how from the fields of special education and general education into participatory basic education. Co-operative teaching was a crucial, underlying support for the strategy and the whole inclusive approach. The findings were explicated and drafted through examples of teaching and learning situations carried out during the research. In this study, a three-level framework for inclusive pedagogies was constructed.

Index terms— inclusive pedagogy, diverse learners, Universal Design for Instruction, zone of proximal development, learning process.

1 INTRODUCTION

eachers who teach groups with diverse learners often feel themselves incompetent and have reported having difficulties because of, for example, insufficient knowledge about different kinds of special needs and how to take into account several kinds of learners as well as lack of time and opportunities to cooperate with special education teachers and other experts **??**Winter, 2006; **??**ambe & Bones, 2006;Lingard, 2007;Kuorelahti, Savolainen, & Puro, 2004). Due to the above-mentioned issues, teaching may embody the pedagogy of indifference as the applied teaching methods are still often grounded on the assumption of a normal or an average pupil. Teachers may whittle down the ways of processing the curriculum. Intellectual demands, the teaching of metacognitive skills and multiple ways of participation may Traditionally, academic skills have been seen as the main objectives of the school education while social goals have been passed over almost unremarked **??**Cf. Dyson, 1999). Much of our traditional pedagogical thinking is based on the medical model of disabilities which is consisted in the division of normal and special children. Consequently, the model does not cater for the diversity of children and their needs of belonging to a community. The goal of inclusion represents the social model of disabilities where the imperfection is not located in the individual but in the society, if the society does not notice the diversity of its members. (Cf. Parker, 1997; Slee, 2001;Peters, 2007;Kivirauma, 2007;Saloviita, 2006). Along with the idea of inclusion, pupils' social welfare has been identified as an important factor of learning (cf. Ainscow, 2007b;Peters, 2007;Väyrynen, 2006;Järventie, 2005).

Therefore, pedagogies of difference need to be developed (Lingard, 2007). Teachers working with diverse children need strategies that help them to construct the multi-dimensional reality of the school. One of the most emphasized views in inclusion is to enhance children's participation in their own community. By

addressing participation in learning, the school may produce experiences of success and also strengthen pupils' social interrelationships. Indeed, the school is an important social community for pupils and students. When participation is fostered, the social justice is furthered as well (Ainscow, 2007b;Järventie, 2005).

2 II. THE BACKGROUND AND THE PURPOSE OF THIS RESEARCH

Teachers should be able to implement the curriculum so that it provides multiple means of representation, expression, and engagement **??**Orkwis & McLane, 1998;Tomlinson, 2005) (Chaiklin, 2003.) The intentional instruction and interaction with the child enables him or her to learn new things (Kugelmass, 2007).

In this research, the idea of learning process was adopted in a quite straightforward way by adapting Aebli's (1983) four functions of learning. In Table **??** the different learning phases are connected to the needed instruction.

3 Table.1 :

The phases of learning process (applying Aebli, 1983) and pupils' need of instruction.

Every time pupils construct new, they are at the zone of proximal development and need intensive instruction. When they are strengthening things they have already learned, their need for instruction decreases: they already are at their actual level of development and do not need much instruction. After having learned the new things, they can try to apply new skills. Then, they take a step forward and may partly be in the zone of proximal level. They will need a little bit instruction or, if their meta-cognitive skills are good enough, they will be able to work with peer support cooperatively.

The pupils who have weak readiness would need continuous intensive instruction if they had as demanding goals as the more advanced pupils. That may expose them to stress, even to burn out, and drop their learning results (Äystö & Das, 1995). They would neither have time to rehearse their skills enough nor gain the needed basic skills. Also the advanced pupils would get bored if they were not given tasks that challenge their learning.

In this article, we will present a step from the ideology of inclusion toward teaching in practice. As teacher educators, our aim was to give models to

4 The construction of a new concept

5 The strengthening of the learned concept

The rehearsing of the learned concept

6 The applying of the learned concept

The pupil is on the zone of proximal development. He/she needs a lot of instruction, maybe scaffolding.

The pupil has gained the basics of the concept. The need of instruction is moderate.

The pupil controls over the concept. It is already on his/her actual level of development and the need of instruction is small.

The pupil is partly on his/her zone of proximal development. He/she needs a little bit instruction or peer support in a co-operative group.

students, clarify some principles, and create guidelines by which inclusive teaching can be planned. In order to achieve these goals, an action research was conducted in an inclusive elementary classroom.

In this study, pupils' learning goals were examined through the lenses of participation which is considered as an essential element in inclusive education. What kinds of teaching methods enabled all the pupils to participate in their learning community in different teaching situations? What kinds of knowledge and skills that would foster inclusive teaching were provided during the teaching practice periods? The research questions are: 1) What factors emerged as the core elements of teaching aiming toward inclusion? 2) How can the strategy of instructions that are based on the learning process be described?III.

7 METHODS

8 The Research Settings and the Methodological Choices

In Finland, all pre-service teachers take a Master's Degree in education, and teacher education is based on a teacher as a researcher -approach. Teaching practicum consists of four periods, three of which take place at the university teacher training school. Usually, the length of the practicum is 4 -6 weeks. University teacher training schools belong administratively to universities and are in constant interaction with the departments of teacher education. Training schools are developmental schools where preservice teachers can practice and test innovative pedagogical ideas. University courses of teachers' pedagogical studies and teaching practicum are tightly connected to each other and form a continuum.

This study is a part of a collaborative action research that was focused on teachers. The first author of the article conducted the research in a Finnish university teacher training school by working as a supervising special education teacher in collaboration with a colleague, a supervising class teacher. During the first two years of one

elementary class (20 children aged seven), the researchers had 11 pre-service teacher students (one man and ten women) practicing in groups of 2-4 in the inclusive classroom.

The support of a special education teacher was brought into the classroom;the teachers did not take the children out of their learning community. Instead, they pursued to combine their teaching competence to a solid basic inclusive education. About four lessons of mathematics and mother tongue a week were taught co-operatively. When pre-service teacher students started their practicum, they were invited to voluntarily participate in this action research by practicing cooperative teaching aiming towards inclusion in the roles of a special education teacher and a class teacher. Only one pair of students refused to take part during the twoyear period of the field work.

The input of the pre-service teacher students was irreplaceable. Their fresh thoughts, reflections on our demonstration lessons, and their own lessons This research can also be regarded as an instrumental case study (Yin, 1989). It took place in one certain class but the particular children were not crucial; the only criterion for how the classes were constituted was that the children lived in the neighboring area of the school. The pupils had diverse cultural backgrounds and various needs of learning. One of the pupils had a medical diagnosis of mental disability. Some of the pupils had experts, such as psychologists or occupational therapists, to support them and their parents. Two of the pupils had an individual education plan: one during the second school year and the other during his third school year. The instrumentality also concerns adults. They themselves were not tested but they helped to conceptualize the research phenomena. **??**Silverman, 2005; **??**cMillan & Wergin, 2006.)

9 The Data and Data Analysis

In this action research, the data was comprised of the following sources: a. general documents (written lesson plans, pupils' tests and some pupils' outputs) b. the research diary c. the interviews of the pre-service teachers (before and after the teaching practicum period) d. enquiry to the pre-service teachers (Likert-scale and open questions) e. the recordings of the supervising conversations between the supervisors and pre-service teachers f. the self-evaluations of the pre-service teachers Altogether there were quantifiable data for 555 pages.

Data analysis already started during the data collection. To perceive the teaching aiming towards inclusion, it was structured by using existing theories. In that way the data, theory, and analysis were in a dialogue along the whole research journey (cf. Layder, 1998). Regularly, it was necessary to rise above the practical actions and consider them in the light of theories-and then to dive again into the practice with new provisions in order to try new ways of action with the others. After the field work, the transcript and organization of the data were done. The recordings and the interviews became the main data while the others supported it. The interviews were organized according to different themes, picking up certain parts of the supervising conversations according to select logical principles such as by choosing the supervising conversations concerning a thematic entity (planning the lessons, the feedback and reflection), and picking up two entities of each teaching practice from both ends of the practice period. The data analysis thus resembled content analysis (Eskola & Suoranta, 2008). Through the analysis process, the data became more concentrated and almost started to talk and to show its deeper meanings in a fascinating way (Ronkainen, 2004). While during the field work, the researchers had to have a subjective role, they now had to look at the data from a distance at a more objective and general level (Herr & Anderson, 2005;Eskola & Suoranta, 2008).

Reliability issues in this research mainly concern the researcher's position. As the researcher is part of the research target, objectivity must be understood in a different way than, for example, in quantitative research (Eskola & Suoranta, 2008). Firstly, the researcher has to recognize his or her position in the research and therefore, in this study, it has been clearly brought out that the first author acted as a teacher researcher. On the other hand, the researcher could and should look at the research from further or in a wider perspective. As the research is reviewed through a conceptual framework, it is possible to analyze it in a more objective manner. This was the purpose in this study as well as the results are considered tightly through conceptualization.

To increase the reliability of the research, various data was collected and careful notes about practices were made. Data analysis was conducted in a logical and open manner. In this article, we have added plenty of practical illustrations to increase the trustworthiness of the study and interpretations but also to give examples of how the research progressed in practice. In addition, the data excerpts that included quotations or references to the teacher students or pupils. In order to protect the participants' anonymity, all names in the excerpts are fictitious.

IV.

10 FINDINGS The Core Elements of Teaching Aiming toward Inclusion

In this chapter, the core elements of inclusive teaching will be introduced by using an example: math lessons during one week are described. The reason why this entity was selected as a sample in the results section is that it includes the core elements of inclusive teaching that were inferred from the research. The core elements were compiled as the summation of the teaching aiming toward inclusion (see Figure 1). 17 April 2007: The measures of lengthcentimeter, meter, and kilometer-were taught this week. Pre-service teacher Alice was in the role of a class teacher and Shannon as a special education teacher. Some of the pupils learned the length measures easily

but for some of them the contents of the concepts were still unclear. After a mutual start the pupils were divided into groups to have exercises. Shannon instructed intensively the group with the increased support needs. At the same time, Alice concentrated on instructing the rest of the groups.

After the lesson, teaching was analyzed and new planning started. Alice presented her plans for the half group-lessons on Wednesday. Some pupils had learned the basic things and some could already begin to do applied exercises. Alice was going to make two different kinds of maps: the first containing easier exercises of journey lengths and the second one with more challenging journeys. The advanced pupils could also compose math stories about the map for each other.

In the middle of the figure, there are three elements of implementing inclusive teaching. Alice: I would have here at the back of the classroom the kind of map exercise where they make up math stories themselves. On the other hand, they must be able to solve them by themselves. There's the kind of, different distances between places and they count them. -At first the other half [of the group] would come and then the other. -Those, who still need the basic counting, would do the basic stuff.

The class teacher: Or if you want that the pupils on basic counting can also [have the map exercises], so could you make the map exercise a little bit easier?-Could they have for example math stories made by you? Alice: That would be easy-those who are more advanced would make up a little bit more challenging exercises. The others could simply have for example like 200 m + 300 m, exactly like "from the store to the kiosk" etc.

To remove the barriers of learning, it is inevitable that several kinds of mediating and teaching methods are used. In the example, the pre-service teachers chose different kinds of instructions for the pupils depending on the phase of their learning process. In inclusive education, during the day the pupils' instruction groups vary from the whole class instructions to small groups and co-operative learning groups. The advanced pupils worked in a co-operative group with peer support while the pupils who needed mediating instruction worked with the teacher. (Pollard, 2005; Haywood, Brooks, & Burns, 1992.) In an inclusive class, teaching is based on social constructive learning and the teacher is the expert and organizer of the learning situation. The teacher's role is to mediate and support learning timely-that is by scaffolding (Kugelmass, 2007;Pollard, 2005). Understanding, analyzing, and synthesizing become more important than only memorizing in learning. Children are taught meta-cognitive skills (Lidz, 1987;Das, 1998;Äystö & Das, 1995).

During the supervising conversation, it was planned how the concept of length could be clearly taught to the pupils with increased support needs. Also the needs of some individual pupils were discussed and it was planned how to construct the learning environment:

The special education teacher: What would then concretize meter? They should understand what could be a meter long. The class teacher: They could measure themselves. They could understand that one meter is somewhere around here.

The special education teacher: They've got estimation exercises in those books-if there is for example a picture of a table? and there is number one, they must choose whether they use cm, m, or km. The class teacher: Already the first exercises can be differentiated so-Then you can differentiate the map exercise, too. Finally, the instruction system was solved. The instruction was given to different pupils with diverse intensity during the week.

The last of the three boxes contains the adults' co-operative teaching (Figure 1). The teacher's profession changes from the lonely performer to a team worker. In the example, the pre-service teachers planned together and decided the distribution of work. In this research, teaching aiming toward inclusion was implemented mainly through co-operative teaching. Inclusive education was based on the adults' collaboration: The teachers negotiated, planned, carried out, and estimated the teaching together. The work was distributed between the teachers (and sometimes assistants) in different ways. (Cf. Thousand, Nevin, & Villa, 2007.) In inclusive education, pupils are regarded as whole persons. That is why the others experts´ services and support are brought into the children's everyday life, too (Saloviita, Lehtinen, & Pirttimaa, 1997;Booth & Ainscow, 2002).

The special education teacher: How will you instruct each pupil?-When you are alone, you can decide that at first those will begin with an easy exercise and you will instruct the second group by yourself. Then you change [the group]. As one lesson comprises 45 minutes, it makes about 12 minutes per group. Alice: Well, tomorrow there's the group A [in the morning]: William, Maria, and Peter, too, can come. The special education teacher: Could William and Maria be in the group that needs support tomorrow and Peter in the basic exercise group? Could Rita be there, too? Alice: Jack? The class teacher: You should consider it carefully because he has difficulties in understanding directions. The special education teacher: Then there are Sam, Oliver, Niles, and Twyla. Alice: Yes, they learned well, they can do it. The special education teacher: Ok. There are all the pupils with the needs of support. For them the concrete exercises and the basic exercise.-Then they will need the teacher's instruction. Then you can leave them to count by themselves. The basic exercises group, how are they? The class teacher: Could they take a basic map exercise?

The class teacher: And it is also possible for them to make up own math stories-If they go to the zone of proximal development, you'll instruct them. The special education teacher: Can you plan the group B [in the afternoon] by yourself? Karl needs special attention. Alice: He has still exercises on his own book. The class teacher: If he cannot work with the others, you can also give him something easier, put the others to work and then instruct Karl. (Supervising conversation **??**7 April 2007) In the uppermost box of the Figure 1 includes the goal of inclusive education: pupils' participation in their learning community. During the one week math lessons

in the example, teaching was planned to produce the feelings of success and being a part of your community. Learning is not the only goal of the school.

19 April 2007: The half-group lessons on Wednesday were a success. The pupils had two fine maps with distances. The pupils told math stories to each other. They had a fun and interesting lesson. The map inspired them to study. The pupils wondered how to say figures over 1,000 meters and learned to convert them into kilometers. When some pupils heard the others to solve the problems aloud, they got support and learned, too. In both groups, the pupils who had not yet learned the concepts did estimation exercises with the teacher: "Choose the right alternative: Your step is 1 km/ 1 m/ 1 cm long. The pupils still needed instruction but now they understood the differences between the measures. (Research diary 19 April 2007) Alice: I had put them into three groups. –The first group, where Karl was, too, had to estimate their steps. They also had the measuring tape. –They measured their ankles and so on. Then for the second group there was a map. It was the easier map. I did-I did one like this, with easier numbers. The special education teacher: Oh, how wonderful! Alice: And then-a little bit challenges, there are [distances with] kilometers and even 1,300 m, so they'll have to convert it into a different unit. Then there were these kinds of exercises: "Otto went to the store. He went by bike to Peter's home. How many kilometers did Otto cycle altogether?" The class teacher: They were so excited! Alice: Robert was thrilled about this map. Alice: Then there was this last group. The special education teacher: Yes, they had the more difficult map. Alice: They could only do it by speaking. Someone tells the route. The class teacher: Jordan was telling a super-long story and the others gave feedback that now the story should end already. –Also it was good that the pupils with better articulacy started to tell the stories at first. So the others could listen and learn how to do it. And when the group wondered how to go over 1,000 meters, clearly Sam seemed confused at first –there was the kind of peer support –. (Supervising conversation 1 April 2007) On Thursday, the pre-service teacher students moved on to kilograms. They taught the weights by measuring groceries. After that, pupils started to do exercises with the book and basic and challenging exercises with Alice's help. Shannon, as a special education teacher, took five pupils around the same table and taught them with real food supplies. (Research diary, 19 April 2007.) On Friday, the last math lesson of the week, few pupils who needed support got exercises that strengthened what they had learned. Some pupils got applied exercises and some the same as earlier but with higher numerical values (Supervising conversation 19 April 2007).

. The Strategy of Instructions That are Based on the Learning Process During the field work, it became clear that the core elements of the teaching aiming toward inclusion worked as a framework but were not enough. It needed a strategy on how to implement teaching in practice. Based on the instruction methods that were used during the field work, a theoretical figure of the systematic use of instructions was created. It deepens the elements of implementing inclusive teaching located in the middle of the Figure 1 by using several kinds of mediating and teaching methods.

In Figure 2, a theoretical sketch of the strategy of instructions based on the learning process is introduced. The teachers' intensity of instruction varies during the learning process. The sketch was formulated in elementary education and therefore it must be considered in the frame of young pupils. In higher education, the students' developed meta-cognitive skills would change the configuration and the role of the teacher. In Figure 2, the systematic use of instruction becomes easier if there is more than one teacher or adult in the classroom. During the day, pupils are divided to different kinds of groups to study. The instruction of every group cannot be intensive but it must vary. Before anything, knowing the pupils is essential. For example, the teachers must observe the children's capability of self-control. Some children may be equal in their skills but can differ emotionally on how to bear frustration (Rasku-Puttonen et al., 2003;Larkin, 2001).

On the lowest stage of Figure 2, the pupils are on the actual level of development. They are on the phase of rehearsing the learned things: they do not need very much instruction and can rehearse quite independently. Yet, the level of cognitive skills must be observed as some children may have to use concrete materials to do the calculation (cf. Piaget's developmental theory). If they are allowed to do so, they are capable of rehearsing independently and succeeding.

The next, a little higher stage of learning challenges, can be implemented through co-operative learning. If the teacher does not instruct much, the children must have quite good meta-cognitive skills to succeed. Learning is co-operative by nature if the participants have a shared goal and they consider and negotiate reciprocally. When working co-operatively, the members of a peer group help each other to learn more as they strive toward something new. (Cf. Kumpulainen & Mutanen, 1999.) Consequently, it encourages teachers to use heterogeneous groups if the distribution of tasks is planned well (cf. The next level of instruction, mediative instruction, can be used for teaching pupils who are at the phase of learning new. It can be implemented for the whole class if the teacher uses ways of teaching that enable the social constructive learning. There may be some children in the class who will need the parallel instruction given by the other teacher (e.g. in mathematics showing the same things with concrete materials at the same time). Everyone participates in the same learning situation with the others. In this research, the mediative instruction was based on the social constructive learning conception (cf. Kugelmass, 2007) and also on the work of Haywood, Brooks, and Burns (1992), Feuerstein and Feuerstein (1991), Äystö and Das (1995), and Lidz (1987).

An example: 21 April 2007. Learning to take away figures below ten from big figures The pre-service teacher Maya: How did you solve this calculation? (In the black board, there's 238+9=247) Pupil Minnie: I counted 8+8=16 and added 1. And also one 10 more. Maya: You used the doubles. (The doubles were learned by hearth

in the class.) Who else used the doubles? (A few pupils raise their hand.) Maya: What about the others? Pupil Aaron: I used the hearth pairs (Two figures that make ten together.) Pupil Ann: I used them, too! Maya: Did you! That's great! Aaron: It's such a quick way. Maya: Yes, it is. (Research diary, 2 March 2007) This week, the class is also taught how to take away and add tens and hundreds. During the whole week, Maya shows several ways to solve the calculations in the black board; by the line of figures, by decimal system and different conceptual strategies. The other pre-service teacher Laura has been instructing three pupils with the needs of intensified support all the week at the same time with the decimal system. They are sitting right in front and Laura is sitting opposite instructing them in a low voice and showing everything in a concrete way. The pupils can participate and answer Maya's questions, too, during the whole-class learning situation. (Research diary, **??**2 March 2007) Scaffolding is used when the challenges of learning are quite high for the pupils. Bruner (1985) created a new conception of instruction, scaffolding, based on Vygotsky's zone of proximal development. In scaffolding, the instructor will have to consider which would be the crucial elements of the problem or skill to be learned. During the instruction, the child's interest in the task must be woken up. The instructor will proceed by continuously diagnosing the child's advancing. The instruction, material, goals and feedback are adapted according the child. (Palinscar, 1986 The last and the most intensive instruction takes place when a pupil needs rehabilitative instruction. If pupils have different kinds of disorders, they will get instruction that demands special expertise. Then they are studying on the upper limit of the proximal level. Usually, the occupational and speech therapists are responsible for rehabilitation but also special education teachers may give rehabilitative instruction in reading, writing, or mathematics. Finally, the instruction that surpasses pupils' zone of proximal level will become useless.

V.

11 CONCLUSION

During the teaching period, the pupils' learning results varied. The teachers had to recognize the diversity of pupils and apply and adapt the curriculum. In the research class, the main principle on planning the teaching for a short period was that during the period every pupil studied both on the zone of proximal development and actual development. When the teachers constructed different exercises for the lessons, they also decided what kind of instruction each pupil was given. The intensity of the instruction was planned systematically following the phases of the children's learning process (cf. Aebli, 1983).

This research was strongly colored with the practical teacher researcher's point of view. However, just talking about inclusion as a noble goal is not enough to make sure that children's rights and teachers' possibilities to succeed in are taken seriously. The indexes of inclusion are important, as is developing new pedagogies. The teacher's profession must be estimated and constructed again. Also the changed working conditions, new competencies, and teachers' in-service and pre-service training have to be renewed.

Along the research journey, our conceptions about inclusion deepened. At the beginning, we were worried about pupils' stigmatization and almost tried to hide the differences between the children. During the field work, we noticed that the small children knew each other well in the class. We started to discuss openly about the children's differences and development. We began to worry about the pupils' possibilities to participate in the mutual actions of their learning community. It bore fruit: nobody was left alone and the children supported each other with joy, for example when Karl, who had learning difficulties, showed how good a swimmer he was. Our pedagogies had started to develop.

Indeed, one of the main ideas is that by molding the educational practices into participative forms, pupils' stigmatization and drop outs can be prevented (Ainscow, 2007b;Väyrynen, 2006;Booth 2000). The two key elements of a child's drop out risk are the basic care (protection, nutrition, rest, and cleanness) and identity. A child creates her/his identity in interaction with the community. When the school works well, it is an important social community which acts as a buffer between the children's welfare and the demands of the society. (Järventie, 2005).

Yet, many important issues remain undefined. In the future, it would be important to research the quality of interaction between the learning community members. Inclusion can take place only after when every child in the group is accepted and can participate in the community life. When these possibilities come true, teaching fulfills the demands of inclusive education. (Cf. **??**kårbevik, 2005;Ohna, 2005.) [1]

Figure 1:

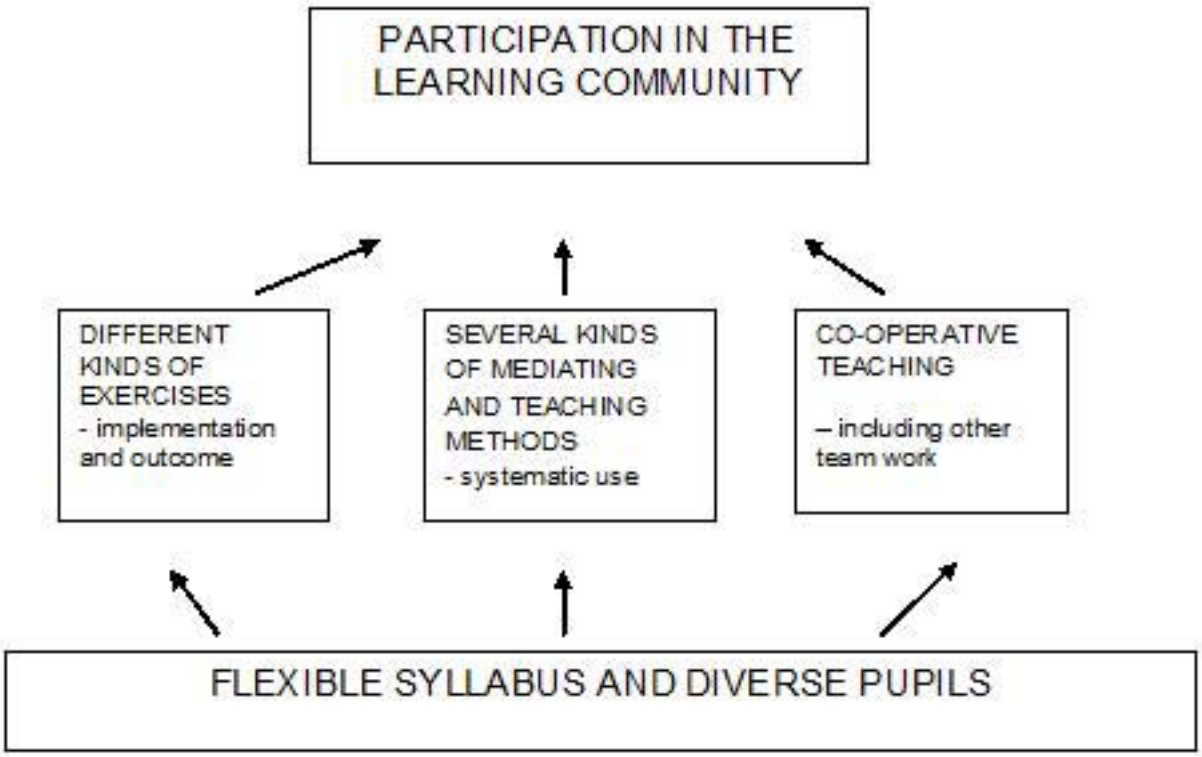

Figure 2:

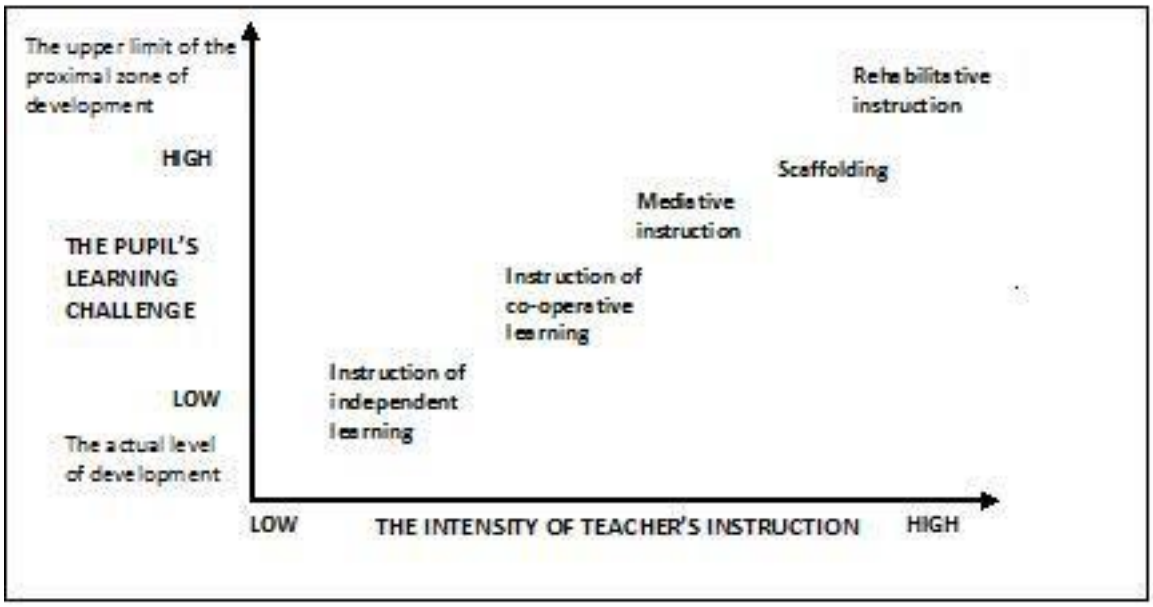

Figure 3:

difference in the principles of Universal Design for
Instruction (UDI):
1.
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Figure 4:

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