

TEMPORAL ASPECTS OF TEACHING AND LEARNING - IMPLICATIONS FOR PUPILS WITH PHYSICAL DISABILITIES

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Abstract: The aim of this study was to describe and try to understand how temporal structures in school setting influence the performance of daily school tasks for pupils with physical disabilities. Seven pupils between 7 and 15 years of age were included. Data were collected through field observations and semi-structured interviews with pupils and each pupil's teacher. The findings show that pupils with disabilities often did not have the time to perform regular daily school activities such as reading and writing. The pupils' time problems were to a large extent influenced by the teaching styles. Four teaching styles were identified. The number of pupils in the class seemed to influence the teacher's choice of teaching style. Variation in teaching styles also could be understood in relation to how teachers handled an educational dilemma that was discovered. Implications of the study on teaching and learning in relation to pupils with physical disabilities are discussed.

When performing daily tasks in school, pupils with physical disabilities are often described as needing more time, compared to their able bodied peers (Bille & Olow, 1996; Paulsson & Grip, 1976; McHale & Cermak, 1992). In a survey of 1500 pupils with physical disabilities in compulsory comprehensive schools, Paulsson and Marsk (1978) found that more than 60% of the pupils had a limited work pace. Moreover, Paulsson (1980) found a relationship between the pupils' work pace and unsuccessful mainstreaming. One of the main problems for the

pupils with physical disabilities who had moved into a special educational class was their inability to keep the same pace as their able bodied peers (Paulsson, 1980). At least to some extent, it may be possible to understand this problem in terms of the temporal structure and temporal norms created for able-bodied children in the classroom. For example, in a recent study Malmquist (1998) found that the temporal limitations set for the national examinations could be one explanation why pupils with physical disabilities show poor results in these examinations.

Time is an important organisational principle in all Western societies (Lundmark, 1993; Pelquin, 1998). Lundmark (1993) argues that a society's social, cultural, and economic organisation will influence the concept of time and how time is understood in society. He argues that socially constructed time is an instrument human beings use to co-ordinate their interaction with others (Lundmark, 1993). As a consequence of this social construction of time, children are brought up to become time-competent adults, which involves a normative process in which children learn about formal and informal time rules and conventions (Westlund, 1996).

The temporal structure of a specific environment can be more or less obvious. The school setting is often found to have a strong temporal structure with clear and detailed time schedules, such as bells ringing to exactly indicate when it is time for work and time for breaks. Besides obvious temporal structures, schools and every social institution develop implicit temporal structures, in this study named temporal patterns, including duration, frequency, pacing and succession (McGrath, 1986). McGrath (1986) argues that when individuals interact they co-ordinate their individual rhythm with others to create temporal patterns in the group, a concept he calls mutual entrainment. But, if the individual rhythm of the two or more partners is too diverse, they may not adjust in an equal way. Rather,

one may simply have to adapt to the others' temporal pattern (McGrath, 1986). Thus, both explicitly and implicitly the pupils are socialised to understand that time is a resource that must be used well (Westlund, 1996). One important task of teachers is to control and correct pupils' inappropriate time behaviour. Only a limited degree of time flexibility can be accepted in schools.

Bernstein (1975) uses the term "frame" to describe the specific pedagogical relationship in time between teacher and pupil. Framing in this context refers to the degree of control the teacher and the pupil possess over the selection, organisation, pacing and timing of the knowledge transmitted and received in the pedagogical relationship. Bernstein (1975) also makes a distinction between a strong and a weak frame. In a strong frame the teacher is the one who decides the selection, the organisation, the pacing, and the timing of the pupils' work and vice versa.

All doing has temporal dimensions and time is always present as a part of the environmental structure. In occupational therapy literature, temporality, in terms of the balance between work and leisure, has been highlighted as essential for health (Kielhofner, 1977; Kielhofner, 1995; Meyer, 1977; Rielly, 1962; Willard & Spackman, 1998). Several authors (Kielhofner, 1979, Suto & Frank, 1994; Yerxa, 1991) have proposed that analyses of the relationship between temporal structures and

daily occupations can help to clarify the potential adaptations that can be made, as well as to understand how temporal structures influence a person's performance of everyday tasks. However, studies that focus on how temporal structures in specific environments influence the daily occupations of persons with physical disabilities are lacking.

In the present study, we focus on explicit and implicit temporal structures that hinder or respectively help the pupil with a physical disability to perform daily school activities. The aim of the study is to describe and try to understand how temporal structures in the school setting influence the daily schoolwork of pupils with physical disabilities.

Method

Selection of Participants

The participants include both boys and girls with physical disabilities who attend compulsory comprehensive school. Most children with physical disabilities in Sweden attend regular classes in their neighbourhood school (Skolverket, 1996). Therefore, most of the participants were selected from such regular classes. A few pupils attend a special education class, i.e. a small class specifically for pupils with physical disabilities. To get a "broad" picture of temporal aspects in different types of school settings we included pupils from different grades, different schools and in different regions.

Persons from the school's health care system and "The national institute of questions concerning pupils with disabilities" (Statens Institut för Handikappfrågor i skolan) identified potential participants. They contacted the pupils and their parents, introduced the study both over the telephone and through a letter, and asked for permission for the first author to contact them. All pupils contacted agreed to participate in the study. The pupils and their families received complete information about the study's aims and the observations were planned in co-operation with each family. In total, seven pupils from five different schools, in five different towns, were included in the study with permission from the school authorities.

Presentations of the Participants

Table I shows that the study includes three girls and four boys 7-15 years of age. All of them attended a local compulsory school together with non-disabled peers except Julia and David who attended a special education class. Some of the pupils used a wheelchair for transportation and some of them walked without any aid at all. All pupils had access to an assistant during the school day.

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Table I: Presentation of the participants, age, locomotion and estimated knowledge

Grade	Junior level		Intermediate level		Senior level		
Student*	Chris	Sylvia	John	Bert	Julia	David	Laura
Age	7	8	10	13	13	14	15
Estimated knowledge level according to the teacher judgement	About average	About average	Over average	Below average	Below average	Below average	About average
Locomotion	Walking with a roller	Powered wheel-chair	Walking	Walking	Powered wheel-chair	Powered wheel-chair	Manual wheel-chair

* All names have been altered

Three pupils were diagnosed with cerebral palsy, two with spina bifida and one pupil had amblyopia and mild left side hemiplegia. Although, all participants had physical disabilities, the consequences were quite different

as demonstrated in table II. For more specific information of the codes in table II, see the International Classification of Impairments, Disabilities and Handicaps (ICIDH), 1980 (World Health Organisation, 1993).

Table II: Classification of the students in terms of severity of disability* based on the International classification of impairments, disabilities, and handicaps (ICIDH)

ICIDH Code	Limitation	Sylvia	Chris	John	Bert	Julia	David	Laura
21	Disability in talking	0	1	1	1	5	1	0
27.3	Other disability in reading written language	1 **	1**	1	3	4	6	1
28	Disability in writing	1	1	1	3	4	6	1
32.2	Other difficulty in using sanitary facilities	5	0	0	0	5	3	2
35.4	Outer clothing	3	3	1	0	6	1	1
38.1	Eating	0	0	0	0	5	3	0
46.1	Transfer from sitting	5	3	0	0	5	3	5

*Severity of disability

0 = Not disabled
1 = Difficulty in performance

2 = Aided performance
3 = Assisted performance

4 = Dependent performance
5 = Augmented performance
6 = Complete inability

* Reflects the degree to which an individual's activity performance is restricted

**These two students were too young to say something more precise.

Data Collection

Data were collected by the first author through field observations (Bogdan & Biklen, 1992; Patton, 1990), planned semi-structured interviews, informal interviews during breaks and a review of related documents, for example the school's schedules. All data collection focused on the temporal demands incorporated into the school setting and the pupils' use of time in the school. To get an understanding of the context of the school setting, both the physical and social environments of the schools were included in the observations (Bogdan & Biklen 1992; Patton, 1990).

Observations

The observer's role was overt, and a full explanation of the purpose was given to the participants, the families and the teachers before any observation was initiated (Patton, 1990). Each pupil was observed during two full school days in the classroom and also, when convenient, during the breaks. In the classroom, detailed field notes were taken. The field notes also contained drawings, the observer's comments, and descriptions of the participants and the surroundings, as recommended by Bogdan and Biklen (1992). The focus of the observation was the pupil with physical disabilities in relation to what was happening in the classroom. Of special interest was the interaction with able-bodied peers in the classroom, and the disabled pupil's opportunities to participate in

the activities of the school setting. Thus, the teacher's instructions, as well as everything the pupil did or said including interaction with peers, assistants and teachers were noted. For every new activity or quotation noted, the time was also documented on the protocol. Measurements of the time sequences were conducted in a discrete manner, starting when the teachers entered the classroom and stopping the moment the pupil left the classroom. The watch was placed on the left arm, which made it possible to measure the time and at the same time take field-notes.

In the classroom, the observer sat outside the group of pupils, but as close to the pupil with disabilities as possible to follow the pupil's work. The observer did not participate in the classroom activities, except on a few occasions on the request of a pupil or a teacher. However the observer interacted with the pupil or teachers during the breaks in a natural manner.

Interviews

Observations in the classroom were concluded by an interview with each pupil and the pupil's teacher, separately. The interviews built upon the observations and the aim was to get the pupil's and the teacher's view and explanation of the situation documented in the field notes. The semi-structured interviews with the teachers also dealt with the teacher's opinion of the participants which was compared to the peers and school results. Each interview took approximately 1 hour. All

interviews were taped except the interview with the girl who used alternative communication and those with the teacher and pupils in junior level. In these interviews, field-notes were taken. All interviews were transcribed.

Data Analysis

The field-notes, the transcribed interviews, and related documents such as schedules, were analysed and interpreted in several steps (Bogdan & Biklen, 1992).

First repeated readings of all data were conducted to obtain an overall picture of the content. The primary focus of the coding procedure was the disabled pupil's use of time and the time problems in the school setting. Data were coded with a line by line analysis. In the next step, a timetable for each pupil's occupational performance during the lessons was made in detail, by using the time sequences documented in the field-notes. Further, every lesson was analysed separately by using the field-notes in combination with the timetable and schedules. The pupils', the teachers' and the assistants' behaviour during the lessons were analysed and related to the documented time sequences. Time was described in relation to, 1) schedules and established routines, 2) on-going activities, 3) interference with pupils' performance, 4) spoken and unspoken rules.

The field-notes including timetables and interviews that were at first coded separately were then compared and

grouped together on a more general level (Bogdan & Biklen, 1992). The different sources of data, the field-notes, the interviews, the schedules and other written information, were used in a cross-validation of the data (Patton, 1990). Simultaneously, a process of going back and forth between the codes and the data was used.

Some typologies and codes related to the time problem for each pupil that emerged from the data were teaching style, pupil's performance, reflection, learning, and class size. The typologies of teaching styles were presented to people from the field of teaching to check if they made sense. All codes and typologies were discussed several times during the process in peer examination involving experienced research colleagues from different disciplines. Accordingly, all findings and interpretations have been discussed from several different perspectives to improve the truthfulness of the study (Kvale, 1997).

Our final interpretation of the relationship between the pupils' work, time pattern, and the identified typologies were checked against all data.

Findings

When the teachers and assistants described the pupil's problems they often expressed them in terms of a pupil being slow, or having a decreased working pace and not being able to keep up with his/her classmates. According to the teachers' judgement, all participants in the study were

reading and writing at a slower speed compared to other children of their age.

With this in mind, one could suppose that all participants should have great problems with the temporal and environmental structure in the schools. To our surprise we did not find this to be true. Certainly we observed individual pupils struggling with, for example, short breaks and time consuming environments such as stairs and classrooms in different buildings. However, it was not primarily the general time structure or the physical environment of the schools that created problems. Pupils with similar disabilities could have different time problems in schools with similar general structures. The key factor often seemed to be the teaching style adopted as shown in the following section. Each studied pupil's time problems seemed to a large extent to depend on the kind of teaching that was applied in the classroom. The teaching styles defined the current temporal pattern that the pupils with

disabilities had to act upon. Each pupil's opportunities to carry out a specific task by her/himself depended to a great extent on the existing temporal pattern, generated by the current teaching style.

The Four Teaching Styles

We identified four different teaching-styles, characterised by the pupils' opportunities to actively participate in the classroom. The opportunities to actively participate in the classroom were characterised as good, when the pupil had an opportunity to work at her/his individual work pace with or without support from the assistant. The teaching styles identified were 1) the conductor style, 2) the group-work style, 3) the dialogue style and 4) the individual task style. Table III shows the teaching styles identified in relation to whom rules the working pace and the pupil's opportunities to actively participate in the classroom.

Table III: The identified teaching styles, and the opportunities to actively participate for students with physical disabilities.

	<u>Conductor style</u>	<u>Group-work style</u>	<u>Dialogue style</u>	<u>Individual task style</u>
Who decides the pace?	The teacher	The group	The teacher	The student
Opportunities to actively participate	Limited	Depends on the group	Mostly Good	Good

The conductor style

Here the teacher's attention was focused on the whole class, all at the same time, and all pupils were expected to synchronise their task performance. The teacher acted as a conductor where the pupils were the orchestra. Often, more than three different tasks were to be carried out within a period of less than twenty minutes. For example, the pupils first had to read in their textbooks, then write an exercise and thereafter copy something from the blackboard. The teacher decided the pace in detail by momentarily telling the pupils when to start and when to finish each task, just like a conductor conducting an orchestra.

The conductor style was observed in different subjects such as, for example, in sports, chemistry, English, and civics but almost always in the classes with more than ten pupils present.

We found that the conductor style was the teaching style that caused most problems for the pupils with physical disabilities. The rapid changes of activities and learning tools during a lesson created time problems for the pupils with physical disabilities. During conductor lead lessons therefore, the pupil had to leave the work to the assistant who did some or all of the tasks that were expected. The assistant for example took books from the bag, sharpened the pencil, found the right page in the textbook, read the reading tasks and wrote the answers in the exercise book. Moreover, the rhythm

during the conductor lead lessons was so fast and unforeseen that there was little room for communication between the pupil and her/his assistant. The pupils with disabilities were not able to perform the demanded task, nor were they able to interact with the assistant in such way that they really took part in the performing of these tasks.

If the assistant was not present when the pupil needed help, the pupil was unable to keep up with the demanded pace. Bert's problem on the day when his assistant was absent illustrates rather well what the disabled pupil could encounter when the conductor style was applied.

The lesson started with a task where all twenty-nine pupils had to answer a survey. A couple of minutes later the questionnaires were collected, although Bert told his teacher he had not completed it and that he needed more time. In spite of this, the lesson went on in a fast rhythm. First there was a short group-work session for about ten minutes, then pupils did reading in the textbook for some minutes, followed by a discussion and preparation of a written report on paper. Finally, the teacher wrote the criteria for the subject's different credits on the blackboard, and the pupils were asked to copy it. Bert did not participate in any of these assignments. After his attempt with the questionnaire at the beginning of the lesson, he dropped his pencil and did not ever use it again, during that lesson. Instead, he just sat passively beside his

classmates, as if he did not care about what was going on. After the lesson the teacher commented on Bert's behaviour, by saying, "*Without his assistant, he is absolutely lost. Well, in some way he is lost with his assistant too, but in a different way. Then at least he performs the tasks.*"

Thus, in the conductor-style, there was no room for a reduced work pace. If the pupils with disabilities could not follow, they became totally dependent upon their assistants or were excluded from classroom participation the way Bert was when his assistant was absent.

The group-work style

In the group-work style the pupils worked by themselves in small groups of two or more peers. The group tasks included one or several different activities and each group had to finish their tasks within a predetermined amount of time. Here each pupil's work pace was related to what other pupils did as well as to the complexity of the tasks. Whether the group-work style facilitated or hindered the disabled pupil's performance primarily seemed to depend on the relationship between the pupils in the group.

If the group members were co-operative, the pupils could divide the activities, within certain limits, in a way that suited each member best according to her or his abilities. For example, when Laura and her friends were working with an assignment in physics, her friends did the practical

things and Laura's role was more of a secretary. However, if the pupil with disabilities was not really part of the working group, he/she could neither chose activities nor influence the work pace. In that case, the group-work style seemed to create time problems for the pupil with disabilities.

Sometimes the pupils worked in a group or in pairs with a parallel task, where each pupil had to do the same thing. In these cases, one participant's reduced work pace obviously created problems, even if there was no specified time limit for the tasks. For example, during a drawing lesson, John and his friend were asked to paint pigs, and after that they should draw a picture together on the same paper. John could not paint his pig as fast as his classmates. When his companion had finished his pig and had been waiting for about fifteen minutes he seemed to become a bit impatient. John noticed his impatience and seemed to hesitate whether to complete his pig, or to adjust to his friend. First he tried to get some help from his friend, he said, "*Do you want to help me with my pig...otherwise I am not sure I can play with you tomorrow?*". When there was no direct positive response from his friend, John changed his strategy. He called out to the teacher that his pig was finished, even when it was not. In such situations, one pupil's work pace was dependent on the other pupil's pace and both or at least one of them had to adjust to the other. The opportunity for the pupil with a

disability to carry out his/her task consequently depended on how fast the able-bodied peers accomplished their assignments. Time limits here were constructed in the interaction between the pupils.

The dialogue style

In the dialogue style, the teacher's attention first of all was directed towards the whole class. The teacher would for example go through a topic orally, but stopped to ask certain pupils questions related to the topic. Here, a shorter or longer dialogue started. The teacher decided the pace in the sense that he/she decided what to narrate, how much, how fast and selected the pupil who should answer a question.

During lessons where the dialogue style was applied, the studied pupils usually did not suffer from any great time problems, since time of task performance could always be adjusted to each pupil's ability. Even if the speed of the teacher was rather high in telling about different topics, answers were allowed to take more time if the pupil needed it. A pupil with speech problems was allowed, for example, to speak slowly, or a pupil, who needed some extra time to think, could get that, within certain limits. Here, the pupils with disabilities were observed to put up their hand as often as their classmates did. The pupils with disabilities seemed comfortable in the situation and they also seemed to experience that they had enough time for the tasks.

The individual task style

In the individual task style, the pupils got one or more individual tasks to carry out in a period of at least 20 minutes. Often, there were no time limits at all for the task. Here each of the pupils could work at her/his own working pace and did not have to accommodate to their mates. Often the pupil also had the opportunity to get feedback on her/his performance. If one pupil needed help, the teacher individually assisted her/him with the tasks.

In the individual task style, the pupils had the best opportunities to carry out daily school activities by themselves as the flexibility of task performance was good, and the pupil did not have to adjust to anybody else. The pupils also worked with the same task during a longer period and therefore had the opportunity to influence how things should be done as well as the working pace. Bert, for example, who previously was described as not participating at all in the conductor style, worked very intensively and independently during the lessons when the individual task style was applied. John and Laura were also observed to work with a minimum of assistance when the individual task style was applied. The individual-task style was used in all classes and in different subjects as for example in language, handicraft, civics, and mathematics, primarily when there were less than twenty pupils in the group.

The Size of Classes

As indicated above, the number of students in the classes seemed to have a certain effect on the teaching style. The conductor style was for instance very seldom observed at junior level, or in the special education classroom, where there were few students in the class as shown in table IV. The group work style was never observed in

the special education class of just four students. The dialogue style and the individual task style were used in all classes, both small and large. However, in the larger classes, the individual task style was mostly used when the class was divided into smaller groups, as for example in mathematics, English and handicraft classes.

Table IV: Type of class, number of students in class, number of teachers' observed, and frequently observed teaching styles.

	Chris and Sylvia's class	John's class	Bert's class	Julia and David's class	Laura's class
Type of class	Regular	Regular	Regular	Special education	Regular
Number of students in the class	10	16*	32**	4	18**
Number of teachers observed	1	5	6	2	7
Frequently observed teaching styles	Dialogue style & Individual task style	Conductor style & Individual task style	Individual task style, Conductor style & Group work style	Dialogue style & Individual task style	Individual task style & Conductor style

* = 25 students in some subjects

** = Divided in smaller groups in some subjects

To Do or Not to Do that is the Question

At junior level and in the special education class, the most used teaching styles were the dialogue style and the individual task style (see, table IV). In these classes, the pupils' own doing in sense of task performance was encouraged, even if some pupils needed much

time. For example in junior level, Chris and Sylvia were supposed to write, read and take care of their own learning tools, even if they needed more time than their classmates. The teacher supported this by waiting until all students had finished the first task before introducing a new task.

In the special education class, the students had the opportunity to use nearly as much time as they wanted and needed in order to complete a task. Julia for example used a high technological system for writing consisting of a computer navigated by infra red radiation that she controlled by a special reflex fastened on her forehead. Although she was good at spelling, a task to copy six lines sometimes took several lessons for Julia to complete. In spite of this, she mostly wanted and was allowed to write by herself. Even David who did not have proper writing or reading skills was given tasks he could manage independently on the computer. As a consequence, the teacher in the special education class adjusted the curriculum to the abilities of the pupils, for example by leaving out historical events of little significance. The teacher explained, *"We have to summarise everything, as the pace is very slow. But - I think - they do the things they have to do well."*

The pupils with severe physical disabilities who were given the opportunities to perform by themselves often lost part of the knowledge that they were expected to receive. At its extreme, their situation could be described as a choice between "time for doing" or "time for knowing". Obviously this put the teachers in a difficult educational dilemma.

One way of handling this educational dilemma was to emphasise doing less and give priority to knowing in terms of reflection and under-

standing. Teachers, who emphasised understanding as most important, had to reduce the pupils' opportunities to do and practice daily school tasks, for example reading and writing, during the lessons. John's teacher provided an example of this. She gave priority to knowing. In her opinion, John should save all his strength for the intellectual work and therefore she avoided tiring him with too much doing. She said, *"It is not necessary to adjust the demands of the intellectual learning objectives, but it is necessary because of his problems, to simplify the practical tasks - the performance, for example writing down answers to questions."* In mathematics, John did not have to copy the numbers, as his classmates were required to do. Instead, he got all the numbers reproduced on a separate paper. He was able to perform the work in his head and subsequently give the answer to his assistant who did the writing. When pupils were supposed to read something he often got help from his assistant. John seemed to understand and to like this way of working. He explained that the assistance in reading increased his understanding of the text. He said, *"The assistant is reading to give me time to think, the opportunity to think at the same time as I am reading."*

Thus, this teacher ensured that John got all the assistance he possibly could get. John's teacher emphasised that John was given the opportunity to hear and understand the course. However, this goal could only be reached at the

price of John's own practice of common school tasks, for example reading and writing.

Discussion

In this study we found that the schoolwork of pupils with physical disabilities was affected by time problems. To our surprise, the general temporal structure, for example the time schedules did not seem to be the major problem. Instead, the time problem could be understood on the basis of the current teaching styles and the teachers' approach to an educational dilemma.

The teaching style implied the tempo and the timing for task performance and other forms of learning, which in turn influenced the pupils' time problems in class. The conductor style was found to be the most demanding for many pupils with physical disabilities, since this teaching style demanded that all the pupils had to keep the same pace. One reason for this was that the conductor style seemed to be based on objectives that suited the average pupil of the class. These findings also correspond with a study by Heimdahl Mattsson (1998) where it was noted that when teachers tended to look at the pupils in the class as a homogeneous group, the handicap for the pupils with disabilities increased.

One of the most interesting findings was the discovery of the educational dilemma faced by teachers of pupils with physical disabilities. The teachers in the study seemed to be forced to choose between "time for

doing" and "time for knowing" when teaching students with physical disabilities. The discovery of the educational dilemma made us reflect specifically on the nature of learning and development in general. Developmental theories argue that learning is an active process that unfolds through interaction, doing, and knowing (Dewey, 1991; Elkind, 1976; Qvarsell, 1976). Doing is a way of interacting with the environment and gives pupils experiences. In schoolwork, the executive aspect of doing (performance) is often emphasised. Knowing involves the active structuring of experiences in two categories, concepts and meanings. Meaning-making (understanding) in school tasks often demands reflection. Earlier understanding is the base for understanding new experiences in a never-ending process (Dewey, 1991; Elkind, 1978; Qvarsell, 1976).

Thus, learning demands both doing and knowing through interaction. A physical disability creates problems with doing and, especially performance. This forced some of the teachers in the study to give their disabled pupils more time to carry out their tasks. If pupils with a decreased working pace are to be able to perform daily school activities such as reading and writing, the teachers have to individualise the teaching, so that the pupil is given the opportunity to work in her/his individual work pace. Emphasising doing, however, threatened the pupils' knowing in terms of understanding and acquiring complete

knowledge of the content of the courses. Qvarsell (1976) also argues that the concept of individualisation can imply that the opportunity for interaction as a prerequisite for learning will be very limited. Whatever strategy the teachers chose, the physically disabled pupils suffered important losses in terms of learning. The theoretical perspective helps us see that the teachers' problems, at least to some extent, were impossible to solve.

However, every teacher was forced to work out a personal compromise, taking into consideration the abilities of the pupils, the size of the class and the nature of the educational task. Even when the teachers in big classes sometimes chose a teaching style with consideration for the pupil with disabilities, our data indicate that the educational dilemma played an important role in working out the personal compromise. Teachers who found doing important for learning a certain subject tended to choose a teaching style that gave room for performance as long as other conditions allowed this. And teachers who emphasised knowing in a specific subject tried to find room for understanding and reflection in the teaching style they adopted.

Another interesting finding also concerned the teachers' choice of teaching style. One circumstance that seemed to influence the teacher's choice of teaching style was the size of the class. The conductor style, for example, was mostly used in big

classes and the individual task style was mostly used in small classes or when big classes were divided into smaller groups. It appears as if the size of the class influenced the teachers' decision to use different teaching strategies, one group oriented and another pupil/individual oriented according to the size of the class in question.

Several authors have investigated the relationship between the size of class and the pupils' learning. It has been assumed that a smaller group should positively affect the pupils' learning (Granström, 1997). An intensive literature review of the topic made by Granström (1997) concluded that reduced class-sizes only affected the pupils' learning positively, if it was combined with changed teaching strategies. Our findings confirm this idea in the sense that teaching styles seem to have a strong effect on time problems, and most probably on learning, for pupils with physical disabilities. However, the study also indicates that class size seems to be one circumstance influencing the choice of teaching styles. The more precise relationship between class size and teaching style should be further investigated. How this influences the pupils' learning would also be interesting to explore in another study.

Based on Piaget (Elkind, 1976), it could be argued that children with physical disabilities have a great disadvantage compared to children who can explore their environments independently (Stukát, 1999). In a review of

the literature on knowledge development among children with physical disabilities, Stukát (1999) found no support for the hypothesis that a motor impairment per se constitutes a major obstacle for cognitive learning. Pupils with impaired mobility (without any damage in the central nervous system) performed around average in school. Stukát's study (1999) also stressed that the children with disabilities seemed to use alternative strategies to really get the experience they needed, which he considered could be an explanation for the said result.

One important issue raised by this study concerns the opportunity for task performance for pupils with physical disabilities. As mentioned earlier, teaching style, group size and the teacher's approach to the educational dilemma influenced the opportunities for task performance. It has been demonstrated that pupils learn reading by reading, and also spelling and writing, in the process of reading and writing (Allard & Sundblad, 1991; Melin & Delberger, 1996; Strömquist, 1993). The paradox was that some pupils with disabilities who, according to the teachers, really needed to improve their skills in reading and writing, seemed to have the least opportunity to practice these skills in the school setting. However the paradoxical result is understandable against the background of the educational dilemma of the teachers. In order to give room for reflection and understanding, teachers had to give up

opportunities for performance. The study points to the tragedy of this dilemma, not only for the teachers, but also for the pupils who seemed to be forced to give up some important side of learning whatever compromise the teachers chose.

One possible limitation in this study is the lack of data about how the pupils experienced the time demands, the teaching styles used and their opportunities to perform in class. These questions, and the pupils' experiential temporal perspective, and how the time demands in the school setting influenced the pupils' experience of their selves as agents are important to investigate further. These questions are also related to the role of the assistant and the concepts of independence and autonomy (Söder, 1989). The findings in this study indicated that the teaching style, to some extent, seemed to define the role of the assistant as well as the pupil's opportunities to direct the assistant and choose how things should be done. This finding was in itself both interesting and important. It will be further discussed in a future paper.

Finally, we would like to point out that this study could have implications for inclusive education (Ait-Hocine, 1990; Kellegrew & Allen, 1996; Law & Dunn, 1993; Madill, Tirrul-Jones & Magill-Evans, 1990; Rabe & Hill, 1996; SOU, 1998:66). It seems important that teachers become aware of the type of teaching style they use and how each teaching style influences learning opportunities for

pupils with physical disabilities. As the educational dilemma seems to influence teaching styles, teachers also need to be aware of this dilemma in order to be able to find the best possible compromise. Further research in this area is needed if the political goal, an equal education for all members in society, is to be reached (Ait-Hocine, 1990; Kalscheur, 1992; Law & Dunn, 1993; Madill et al., 1990; SOU 1998.66).

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