Chapter 4
"Usually We Are Not Where the Teacher Is"

Individualized Teaching Methods in Mathematics Classrooms

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4.1 Introduction

A robust finding in educational research is that student learning is positively affected by *teacher support* and that teacher support is particularly critical for students' engagement in their own learning (OECD 2005; Hattie 2009; Baumert et al. 2010; Bryk et al. 2010), a vital factor for achieving good learning results (Kumar 1991; Boyd et al. 2009; Hill and Grossman 2013). Meichenbaum and Biemiller (1998) argue that teachers, in order to optimize their support of student learning, must take into consideration and be sensitive to the different stages in the learning process, and plan and balance the classroom activities accordingly.

In this chapter, data from both quantitative and qualitative studies conducted in lower secondary schools will be presented, analyzed and discussed from these perspectives. Firstly, the correlation between the PISA constructs *Supportive Teacher* (ST) and *Effort and Perseverance* (EP) will be explored. This examination will be based on regression analysis performed on Norwegian student questionnaire data from the PISA 2000 Study. The main purpose of this analysis is to investigate if these survey data back the notion of the importance of teacher support for students' effort and perseverance. Secondly, the findings obtained in the examination of the survey data will be discussed in relation to an analysis of data from the PISA+ Video Study. The key issue in this analysis is to investigate how individualized instructional methods can affect teacher support for student learning. Particular attention will be given to a specific individualized methodology, which was used in all the videotaped PISA+ classrooms. A central element in this methodology is the use of work plans, a written document that prescribes the work to be done

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K. Klette et al. (eds.), *Teaching and Learning in Lower Secondary Schools in the Era of PISA and TIMSS*, Professional Learning and Development in Schools and Higher Education 12, DOI 10.1007/978-3-319-17302-3_4

by the students within a specific period of time – most often a period of two weeks. Another important element in this methodology is the use of *study lessons*. These are lessons set aside on the weekly schedule in which students are given the opportunity to complete the tasks and assignments from the work plan.

The argumentation in this chapter will be based on empirical observations and analyses of video captures from the PISA+ classrooms, and statements from the student and teacher interviews. Even if all the empirical evidence is taken from the mathematics classrooms in this study, the themes discussed will be relevant in relation to other subjects as well.

As pointed out in Chap. 1, the Nordic countries, including Norway, have a long tradition in attempting to provide equal opportunities for all students by using national curricula and by maintaining a non-streamed and unitary structure of their school system. Furthermore, individualized instructional methods, inspired by ideas related to educational progressivism and philosophically based on principles of equity, have been promoted in Norway for quite some time, backed by key curricular documents (KUD 1997; KD 2006). As equity issues today are seen as one of our key educational challenges (OECD 2013), it seems important to investigate if individualized teaching practices do seem to secure broad learning opportunities for all students. The ambition of this chapter is to make a contribution to this discussion.

4.2 Theoretical Perspectives

4.2.1 Classroom Learning Settings

The science of learning is a very comprehensive area of study, engaging researchers from various fields and with quite different approaches to their object of study. One of the major changes in research about learning conducted during the last few decades is that more research is carried out in complex environments, such as classrooms and everyday settings (Greeno et al. 1996; Mayer and Alexander 2011). Bransford et al. (2006), in their review of learning theories, argue that a more robust understanding of learning can be reached by making synergies of different research traditions. They state that it is particularly important to bring together the different strands of research about learning carried out in relation to educational settings, making it more relevant for the field of practice.

Meichenbaum and Biemiller (1998) link concepts within learning theory to the actual classroom setting, involving teachers, students and relevant artifacts. They argue that classroom learning should include three types of situations or settings, namely *the acquisition setting, the consolidation setting* and *the consultation setting*. The acquisition setting is related to the teacher's introduction of new content material, where the teacher's role is to create an inviting learning environment, prepare students for instruction and provide guidance, monitor and offer feedback. In the consolidation setting a major part of the teacher's responsibility is to carefully

plan different practice tasks on which students will have a high success rate, to scaffold and to give calibrated assistance by being sensitive to students' need for support. Additionally, the teacher should try to bolster students' self-confidence. The teacher's role in the consultation setting is mainly to have students engage in self-reflective thinking, to provide opportunities for the students to convey the essentials of the newly learned content to others and explain to peers how to solve different tasks, and to generally stimulate students' metacognitive competences. Reflection and self-evaluation are continuous parts of these different learning situations, but are especially prominent in the consultation setting. Overall, it is the teacher's task to balance the various aspects of these three settings in order to stimulate and support student learning. A clear coherence between the different learning situations is strongly recommended. To attain such coherence, the teacher needs to plan the different stages and how the relevant learning activities should be applied, and to simultaneously be responsive to the students' actions and reactions.

Meichenbaum and Biemiller (1998, p. 118) further argue that the three settings described above can be operationalized in relation to classroom learning processes. They summarize the teacher's task in the *acquisition setting* in the following four points:

1. Providing advance organizers;
2. Using informed instruction;
3. Accessing and activating the students' prior knowledge;
4. Assessing the students' misconceptions that could interfere with their task engagement and performance.

They claim that each one of these points is important in preparing the students for the learning of new subject content. Generally, they argue that a key element in the acquisition setting is to motivate the students to care about learning new material. In the acquisition setting, therefore, the teacher first of all needs to motivate and prepare students for attaining new knowledge and skills through introductions at the beginning of a work session. In such introductions the teacher should provide advance verbal, visual and/or metaphorical organizers and activate students' prior knowledge of the new theme. Later in the learning process, students must be given opportunities to consolidate their skills and strategies by working, in groups or individually, on suitable and challenging tasks and exercises related to the themes introduced. In their description of the *consolidation setting*, Meichenhaum and Biemiller point out the importance of maintaining coherence with the acquisition setting. In this setting, students should be provided with opportunities to do exercises and tasks related to the themes discussed in the acquisition setting. But while students in the acquisition setting often need continuous support, students who are consolidating skills or strategies need less direct assistance. Two broad kinds of consolidation tasks are listed as:

1. Tasks that emphasize repeated performance of the skill;
2. More complex, applied tasks.

For both kinds of tasks it is important to adjust task difficulty to student abilities. A mismatch will easily lead to reduced learning opportunities and low motivation.

In the final stage, the *consultation setting*, the class should elaborate upon the newly acquired knowledge. Meichenhaum and Biemiller (1998) argue that the consultation setting is first and foremost characterized by the idea that if students are to master a set of skills and strategies, they must go beyond merely responding to the teachers' request and become autonomous learners. In order to achieve this, it is important that they are provided with opportunities to defend and explain their own work and to act as consultants for peers. The students should be afforded an active role in this learning setting. Klette (2007) argues that assisting students in the elaboration process can be done in the *summing up* at the end of a lesson or work session by connecting activities to key concepts, themes and theories within the actual subject and involving students in relevant discussions.

Introductions, *well-planned tasks* and *summing up* can thus be considered to be three important elements in the structure of teacher support for student learning. In the PISA+ Video Study these elements were central factors in our theoretically based foundation for developing coding manuals for analysis of instructional quality.

4.2.2 Protocols Developed for the PISA+ Video Study

The analysis of the video captures in the PISA+ Video Study was done in two stages. Firstly, in order to be able to make comparisons across subjects, a common set of codes and categories was developed and used for all three subjects (Klette et al. 2005). Secondly, an additional protocol was developed for analysis of the science lessons (Ödegaard and Arnesen 2006). The categories in this coding scheme were to a large degree based on the above-presented concepts, developed by Meichenbaum and Biemiller (1998), but were also influenced by research carried out within science education, particularly by Lemke (1990) and Mortimer and Scott (2003). A modified version of this coding scheme was later used in the analysis of the mathematics lessons (Ödegaard et al. 2006). All the protocols used in the PISA+ Video Study were structured using a certain number of main elements or categories. The one used for mathematics comprised seven such elements. Each element then had a number of sub-codes. "Teaching activities" was one of the main categories in this coding scheme and in Table 4.1 the eight sub-codes of this category are presented and related to Meichenbaum and Biemiller's three types of settings for classroom learning.

As can be seen in Table 4.1, all the eight codes can be linked to Meichenbaum and Biemiller's three types of settings, three to the acquisition and consultation setting and two to the consolidation setting.

Table 4.1 The sub-codes for the element "teaching activities" in the mathematics protocol in the PISA+ video study

	Code	Explanation	Setting
1	Review	*Teacher summarizes or asks questions about themes from previous lessons*	Acquisition
2	Motivation, appetizer	*Teacher uses an artifact or an exciting problem to collectively motivate student interest in a new topic*	Acquisition
3	Teacher summary	*Teacher summarizes the work done in the lesson*	Consultation
4	Going over the "do now"	*Attending to common questions related to the work done during the lesson*	Consultation
5	Going over the homework	*Attending to questions related to homework, rehearsing*	Consultation
6	Developing new knowledge	*New knowledge is developed*	Acquisition
7	Developing new practical skills	*Mathematical knowledge is applied to a practical problem*	Consolidation
8	Offer seatwork	*Students are doing seatwork*	Consolidation

In the next paragraph, the work plan methodology often used in Norwegian lower secondary classrooms will be briefly presented.

4.2.3 Work Plan Methodology

Work plans can be defined as a written document, usually developed and prepared by the teacher, who prescribes the learning activities and tasks students are expected to perform within a specified period, often two or three weeks. Work plans have been used in Norwegian primary and lower secondary schools since roughly the mid-1990s, to the point where the majority of teachers now use this pedagogical tool. In a student survey from 2009, more than 60 % of lower secondary Norwegian students confirmed that they used work plans (Skaalvik and Skaalvik 2009). That the use of work plans is widespread in Norwegian lower secondary classrooms is also confirmed by other sources. In the PISA 2012 School Questionnaire, more than 80% of the headmasters from the participating schools reported that work plans were frequently used by their teachers.[1]

Work plans have a rather vague and weak theoretical foundation, but it is assumed that different educational reform initiatives linked to educational progressivism, the 'integrated day' (Taylor 1972) and policies for differentiated learning (KUD 1997; KD 2006) have inspired the development of the Norwegian work plans

[1]Unpublished information from the Norwegian PISA 2012 data file.

(Bergem and Dalland 2010). Klette (2007) and Dalland and Klette (2014) emphasize that the work plan is first and foremost a practical tool that enables educational differentiation and a more flexible organization of the weekly schedule. The last point is particularly realized through the use of *study lessons*. In these lessons the students themselves can decide what to do, the idea being that they should do assignments from the work plan under teacher guidance. Providing work plans and study lessons is generally meant to empower the students by allowing them to plan their learning activities to a greater extent, and in this way getting them more involved in their own learning processes.

4.3 Data and Methods

The analysis in this chapter is based on data from the mathematics classrooms in the PISA+ Video Study and survey data from PISA 2000. In the following section, a few key elements regarding these studies will be presented. A more thorough presentation of the design and methods used in the PISA+ Video Study is given in Chap. 1. For a comprehensive portrayal of the PISA study, see the Norwegian national reports (Lie et al. 2001; Kjærnsli et al. 2004; Kjærnsli and Roe 2010).

4.3.1 PISA+ Video Study

As described in Chap. 1, the main empirical data in the PISA+ Video Study consists of video recordings, field notes, copies of students' work and interviews with students and teachers. All the video-filmed mathematics lessons ($n = 38$) were analyzed on the basis of protocols developed in this study (Klette et al. 2005; Ödegaard et al. 2006) and some of the results from this coding will be used in the analysis in this chapter. An additional data source is excerpts from student interviews ($n = 31$) and teacher interviews ($n = 11$) that were conducted in relation to the video-captured mathematics lessons. Interview quotes presented in this chapter are selected on the basis of two criteria; their relevance to the themes and problems being discussed and their representativeness for the students' and teachers' points of views, as expressed in the total sample of interviews collected in this study.

4.3.2 PISA

The two PISA constructs analyzed in this chapter (Effort and perseverance and Supportive teacher) both consist of a group of statements, four and six, respectively, that students are asked to evaluate. By using a certain number of statements, each

covering slightly different aspects of the actual construct, one can meet reasonable demands on both construct validity and reliability. Students' responses are related to a scale of frequency for each statement, and the students' scores on each particular construct appear as an aggregated index calculated from answers to each individual statement. While high construct validity requires that the various aspects of the actual theoretical construct are reasonably well covered by the statements taken together, reliability is often measured using the so-called Cronbach's alpha coefficient (Crocker and Algina 1986). The latter is calculated from the consistency of students' responses to the different statements measuring the construct. Cronbach's alpha indicates how much the actual statements have in common and which therefore are not based on pure chance by the specific statements selected to represent the construct. An alpha above 0.70 is generally considered to provide sufficiently high reliability for a construct. Cronbach's alpha for the two PISA 2000 constructs analyzed in this chapter, are respectively 0.81 (EP) and 0.79 (ST).

4.4 Findings

4.4.1 Description and Analyses of the Applied PISA Constructs

To calculate the values of the various constructs that are measured in PISA, an international scale with mean 0 and standard deviation 1 for individual students in the OECD area is most commonly used. This scale is applied for both of the PISA constructs presented in this chapter, Effort and Perseverance (EP) and Supportive Teacher (ST).

The values of EP are calculated from students' responses to the following four statements, where students are asked to tick off one of the alternatives: *almost never, sometimes, often, almost always*:

1. When I do schoolwork, I work as hard as I can.
2. When I do schoolwork, I continue to work even if the problem is difficult.
3. When I do schoolwork, I try to do my best to gain new knowledge and skills.
4. When I do schoolwork, I do my best.

A 4-point Likert scale is used and the Norwegian mean value for this construct is relatively low. Norway is, however, among the OECD countries in which this construct has the strongest positive correlation with student test score, about 0.25 (Lie et al. 2001). Consequently, an interpretation of these data can be formulated as follows: *Norwegian students are characterized by having relatively low scores for effort and perseverance. Simultaneously, this factor is particularly important in Norway in relation to students' academic performance*.

1. The teacher shows interest in the individual student's learning.
2. The teacher gives students the opportunity to express their opinions.
3. The teacher helps students with their work.
4. The teacher continues to explain until students understand.

5. Teachers do a lot to help the students.
6. The teachers helps students to learn.

The Norwegian mean value for this construct (−0.03) by far the lowest among the Nordic countries, though just barely below the OECD mean (0). However, for this particular construct, Norway has the highest positive correlation with students' test scores of all OECD countries participating in PISA, namely 0.15 (Lie et al. 2001). An interpretation of these data is as follows: *As perceived by the students and from a Nordic perspective*, *Norwegian teachers provide relatively little professional help and support in their lessons. At the same time, teacher support seems particularly important for student achievement in Norway*.

A crucial question now seems to be whether the apparently weak teacher support influences students' effort and perseverance. This can be evaluated by analyzing the correlation between the two PISA constructs, ST and EP. Figure 4.1 shows the graphical relationship between ST and EP with 95 % confidence intervals. For this analysis, the students are divided into four equal groups based on their values on the ST construct. Group 1 consists of the quartile of students (0–25 %) who experience the least teacher support; groups 2 and 3 consist of the two quartiles of students (26–50 % and 51–75 %) with consecutively rising values for teacher support, and group 4 consists of the quartile of students reporting the highest levels of teacher support. The vertical axis is ordered by stepwise and increasingly higher values for the EP construct.

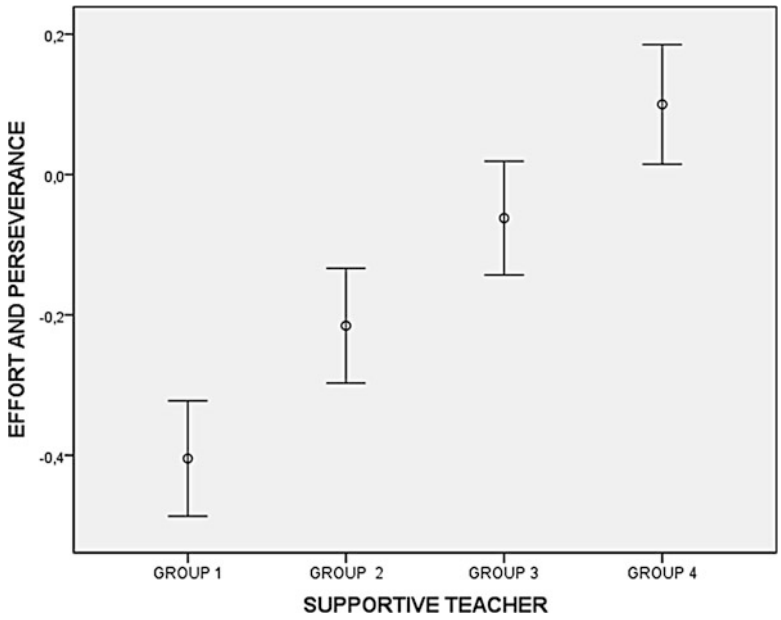

Fig. 4.1 Correlation between the PISA constructs ST and EP for Norwegian students, grouped by quartile levels for the construct Supportive Teacher

Figure 4.1 indicates a clear positive correlation between the degree of teacher support and students' academic effort and perseverance. Students' effort and perseverance increases step by step following higher reported teacher support.

4.4.2 Analyses of Data from the PISA+ Video Study

In the next section, data from the PISA+ Video Study will be analyzed with the purpose of complementing the PISA findings that have been presented above. The analysis will be framed in relation to Meichenbaum and Biemiller's (1998) theories about the importance of structuring students' learning experiences, i.e. that the teacher systematically orchestrates the various learning settings.

4.4.3 Work Plan Methodology: The Acquisition Setting

So, how was the acquisition setting handled in the mathematics classrooms in the PISA+ Video Study?

As previously stated, all of the 38 video-captured mathematics lessons in this study were coded using protocols developed by the participating researchers. One main category in the protocol developed for mathematics (Ødegaard et al., 2006) was labeled *teaching activities*. In Table 4.2 the percentages of codes under this category are presented for each of the participating classrooms.

As can be seen in Table 4.2, *developing new knowledge* was the most frequent activity in Class 2 and the second most frequent activity in three of the other five classrooms. In developing new knowledge, which in Meichenbaum and Biemiller's analytical scheme belongs to the acquisition setting, the observed mathematics teachers would typically try to get the students involved by asking questions, inviting them to participate in a classroom dialogue. All the six mathematics

Table 4.2 Percentages of activities under the main category "Teaching activities" in the six mathematics classrooms in the PISA+ video study

Codes	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Total
1. Review	3	8	32	7	3	34	87
2. Motivation, appetizer	1	1	4	2	16	0	24
3. Teacher summary	0	0	0	5	2	0	7
4. Going over the "do now"	0	0	0	3	0	1	4
5. Going over the homework	0	0	0	29	14	6	49
6. Developing new knowledge	21	52	0	22	20	2	117
7. Developing new practical skills	0	0	14	2	0	0	16
8. Offer seatwork	74	38	44	30	46	57	289

teachers in the PISA+ Video Study applied such dialogical instruction to a high degree. This can be interpreted as an attempt to '*access and activate the students' prior knowledge*', one of the central points in Meichenbaum and Biemiller's portrayal of the acquisition setting.

Meichenbaum and Biemiller also emphasize the importance of motivating students. To what degree the mathematics teachers were inclined to use appetizers to motivate their students was also categorized in our study and the results can be seen in Table 4.2 under the code 'Motivation, appetizer'. This code is explained as: 'teacher uses an artifact or an exciting problem to collectively motivate student interest in a new topic'. However, to get a more accurate picture of how often the teachers actually used appetizers, a more detailed analysis of the frequency of this activity is presented in Table 4.3.

As can be seen from Table 4.3, 'motivation/appetizer' was used in 10/38, or about 26 % of the mathematics lessons in the PISA+ Video Study, unevenly distributed between the six classrooms. However, except for classroom 5, very little time was used on this activity. There might be several explanations for this. One reason could simply be that in some lessons students were in a different stage of the learning process (consolidation or consultation setting) and that new themes were not introduced. A different explanation, related to the use of work plan methodology, also seems plausible. As a consequence of the use of work plans, students were often working on different tasks and exercises, i.e. they were not always thematically synchronized. This is expressed in the following excerpt from a student interview:

Interview 1

Interviewer:	But when you are doing work in mathematics lessons, sitting in pairs, are you working on the same tasks?
Lise/Anne:	No.
Interviewer:	So you're working on different tasks?
Anne:	Some are ahead and some are behind (in relation to the teacher's review)
Interviewer:	Yes
Lise:	. . . some are at the same place.

Table 4.3 Frequency of the use of motivation/appetizer in the mathematics classrooms in the PISA+ video study

Classroom	Number of lessons being video filmed	Number of lessons in which motivation, appetizer were used	Minutes used on motivation, appetizer (in avg.)
1	3	1	1
2	7	1	2
3	7	3	3
4	10	2	2
5	7	3	10
6	4	0	–
Total	38	10	

The student statements in Interview 1, confirming that the students were often unsynchronized with the teacher review, seem to support the assumption that the use of work plan methodology would generally make it less pertinent to apply appetizers that would be relevant for all the students.

4.4.4 Work Plan Methodology: The Consolidation Setting

All the work plans used in the classrooms participating in the PISA+ Video Study had elements of differentiation. In most cases differentiation was related to the amount of tasks and exercises the students were supposed to complete, but in some cases it was also connected to task difficulty (Bergem 2009). However, the self-pacing that work plan methodology stimulates had some peculiar consequences relating to the coherence between the theoretical issues discussed and the tasks performed. Very often reviews of new subject content were followed by working sessions in which many students were occupied with tasks that were not related to the themes and issues just discussed. The following interview excerpt illustrates this point:

Interview 2

Interviewer:	If the teacher takes you through some theme on the blackboard, do you afterwards work on related exercises, or?
Anders:	Yes
Interviewer	. . . or do you just continue doing exercises from the work plan?
Anders:	It all depends . . .
Bendik:	We usually start doing exercises . . .
Anders:	Yeah, I just continue where I left . . .
Interviewer:	Where you left on the work plan?
Anders:	Yes, usually we are not where the teacher is.

The two students clearly state that it is where they happen to be on the work plan that determines what tasks and exercises they start to work on even after a review of a new theme. According to the students, it is rather rare that this coincides with the teacher's planned progression of the subject content. This makes the relationship between the acquisition and the consolidation setting quite weak and it seems to be a direct consequence of using work plan methodology. Decoupling activities and tasks from relevant instructional practices, as here described, may lead to a fragmentation of the students' learning experiences. Tasks and activities can easily be experienced as isolated incidents with a weak connection to important theoretical framing, and this may severely reduce the actual learning outcome. Obviously, this is not planned for, but must be considered to be an unintended consequence of this way of organizing student work.

There are also other points connected to the consolidation setting worth mentioning. Several of the statements that make up the construct SL in PISA are related to the teacher giving academic guidance and assistance to the students. One of

the observations made in the PISA+ Video Study was that in the study lessons, when students were working on academic tasks and exercises, teachers with relevant expertise and competence were not available to give adequate guidance and support (Bergem 2009). This is clearly expressed in the following excerpt from an interview where the student has just described using parts of the study lesson to work on tasks in mathematics:

Interview 3

Jon:	Now, I spent half an hour, or I spent half the study lesson to complete half of my assignments in mathematics.
Interviewer:	Ok, so you spent half an hour, and then you completed half of it?
Jon:	Yeah, because, it got worse, more difficult, division and multiplication and stuff. So it was a bit difficult. And I had to understand it all.
Interviewer:	Yes, but did you get any help from the teacher?
Jon:	Yeah.
Interviewer:	But, there was no math teacher there?
Jon:	No, but there was a Phys. Ed. teacher and an English teacher.
Interviewer:	And they could help you?
Jon:	Yes.
Interviewer:	So you understood everything?
Jon:	Well, I didn't get much help from the English teacher, but the Phys. Ed. Teacher helped me.

All schools or classes that organize study lessons must take many factors into consideration when allocating teachers for these lessons, for instance the teachers' weekly schedules and their various duties and tasks. Economic costs must also be taken into account, and there will usually be only one or two teachers available in these lessons to guide the students. Naturally one or two teachers will not cover all the competences needed for giving guidance to all students in all subjects, which means that many students do not get the support they need from professionally competent teachers during study lessons. In spite of these logistical puzzles, it is problematic if students consistently do not get adequate support during this phase of their consolidation setting. This is especially challenging when study lessons constitute a significant part of the weekly schedule. At one of the classes in the PISA+ Video Study there were eight study lessons of 30–45 min a week.

4.4.5 Work Plan Methodology: The Consultation Setting

A summary at the end of a lesson or in the final stage of a thematic working period is an important aspect of the consultation setting (Meichenbaum and Biemiller 1998). In such summaries, the students should be stimulated and guided by the teacher to evaluate different aspects of their learning session, i.e. how the activities they have been involved in are related to central categories or themes, the interrelation of

different content areas, etc. Analysis that has been conducted on the PISA+ video data reveals that summaries at the end of a lesson were seldom carried out (Klette & Ödegaard, 2012). Whether this was due to the use of work plans or not is clearly difficult to decide. However, it may seem less relevant to make summaries when the students are occupied with different tasks and activities, depending on their working pace and their general strategies for handling the work plan.

Another aspect of the consultation setting is to afford students opportunities to engage in self- reflective thinking and to participate in high level discussions with peers. So how did the different elements in the work plan methodology seem to be in line with these thoughts? A principal idea behind the work plan methodology is to empower the students by giving them opportunities to make decisions related to their work situation in school. This is conceived as potentially heightening student motivation and learning. However, based on the analysis of the mathematics lessons in the PISA+ Video Study, the increased student influence seemed mainly to be related to organizational features, i.e. what, when and how to work on subject related tasks, and was to a lesser degree linked to developing broader and deeper meta-cognitive or subject-related competences. For instance, it was observed that very little time was used on group work in which students would have opportunities to explain their work for fellow students and be involved in consulting peers. In fact, only in about 5 % of the time allocated to mathematics was group work applied. Thus far from promoting subject-based learning, the use of work plan seemed to lead to an emphasis on individual seatwork at the expense of other methods of working.

4.5 Discussion: Implications for Practice Field

Many educational researchers argue that raising levels of student effort and perseverance are essential for improving student learning outcomes (Marzano 2003; Hattie 2009). The analysis of the selected PISA constructs in this chapter indicates that teacher support is a substantial factor in increasing effort and perseverance among Norwegian 10th grade students. The importance of teacher support is also highlighted by Meichenbaum and Biemiller (1998). They argue that such support needs to be conducted systematically. By structuring the learning situations in an ordered way, they claim that the students can be afforded optimal support in relation to developing key competences.

In light of these empirically and theoretically based statements about the value of teacher support, some of the presented findings from the current analysis are quite alarming. According to this analysis, the use of work plans systematically influenced the structure of the teaching situations in a way that constrained the teachers' opportunities to support student learning. Introductions and summing up were made less relevant by the fact that students' work was not synchronized with the taught topic, and individual seatwork was prioritized at the expense of collective ways of working with subject matter.

Even though the sample of classrooms in the PISA+ Video Study is limited, there are reasons to believe that these findings are relevant within a broader context. Similar effects of work plans on student learning experiences are also reported and commented upon in other recent studies from Norwegian primary and lower secondary classrooms (Olaussen 2009; Helgevold 2011).

Providing equal opportunities for all students and moderating the effect of students' social economic status are highly prioritized goals within the Norwegian educational system. Optimizing teacher support is considered by researchers to be a crucial factor for success in attaining these ambitious objectives (Hattie 2009; Baumert et al. 2010). Maintaining teaching and learning practices that diminish teacher support is therefore clearly not to be recommended. However, complementary analysis of the different aspects of extensive use of individualized teaching methods should be carried out in order to broaden our understanding of the consequences of prioritizing this teaching approach.

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