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Maximising meaning

creating a learning environment for reading comprehension of informative texts from a Vygotskian perspective

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ORIGINAL PAPER

Maximising meaning: creating a learning environment for reading comprehension of informative texts from a Vygotskian perspective

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Abstract Sociocultural theories based on the work of Vygotsky have been increasingly influential in educational sciences. Developmental education (DE) is a pedagogical approach based on Vygotskian theory that has inspired primary schools in the Netherlands to change the learning environment innovatively in a comprehensive way. In this article, we focus on the learning environment for reading comprehension of informative texts in upper-primary grade classrooms in DE. Our aim is to contribute to a more profound understanding of the characteristics of learning environments that are inspired by a Vygotskian approach and that are conducive to reading comprehension of informative texts. Five fourth-grade expert DE teachers participated in a multiple case study aimed at describing and analysing these characteristics for the domain of reading informative texts. Data were collected over a period of six to eight weeks for each teacher and consisted of videotaped interviews, classroom observations and documents. We conclude that DE learning environments are focused on maximising meaning from text for students. This is achieved by organising learning on the basis of emergent goals within students' participation in sociocultural practices.

Keywords Informative texts · Meaningful learning context · Primary education · Reading comprehension · Reading for meaning · Reading motivation · Reading strategies · Vygotskian theory

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Introduction

Sociocultural theory based on the work of Vygotsky has been increasingly influential in educational sciences. In educational practice, Vygotskian notions such as the zone of proximal development and scaffolding are well known. In few schools, however, teaching occurs in learning environments that are based on Vygotskian concepts in a comprehensive way. In Vygotskian sociocultural theory, meaningful learning, understood as the process in which a person becomes connected to the cultural world, is a central concept (Smagorinsky 2001, 2011). Developmental Education (DE) is a pedagogical approach based on sociocultural theory as defined originally by Vygotsky and further elaborated in Cultural Historical Activity Theory (CHAT) (Van Oers 2009; Wells and Claxton 2002). It has inspired a considerable number of primary schools in the Netherlands to change the learning environment innovatively in an all-encompassing way, with a view to meaningful learning for students (Wardekker 2012).

This view of meaningful learning has been elaborated and implemented in many DE classrooms in primary schools in the Netherlands. In DE the learning environment is mainly defined by the situated sociocultural activities in which students and teachers are collaboratively involved. Many teachers working from this point of view are satisfied with their implementation of these ideas into their classroom practices. However, there is still need for a deeper understanding of the dynamics that underlie the processes and outcomes of this activity approach to learning environments, and especially for an understanding of the conditions that contribute to the process of maximising meaning.

In this study, we focus on the learning environments that are created in DE for reading comprehension of informative texts (as opposed to fictional texts and poetry). Many students in secondary school have difficulties understanding discipline-specific content of written texts (Snow 2002) and disengage themselves from reading (Guthrie et al. 2012). PISA international studies in 2009 showed that 18 % of 15 year-olds have difficulties in identifying the main idea in a text (Fleischman et al. 2010). In the Netherlands, 20 % of the students in grade 7 cannot understand subject-matter texts without a teacher's help (Hacquebord, Linthorst, Stellingwerf and De Zeeuw 2004). Students' motivation to read decreases in the higher grades of primary school and in secondary education (Bogaert et al. 2008). Therefore, it is necessary to take additional measures to prevent functional illiteracy and disengagement in primary school rather than to try to address it in secondary school. In primary schools, effective and motivating learning environments and educational strategies are needed to teach reading for comprehension to all students.

The present qualitative study analysed the learning environment for reading informative texts in Developmental Education. Our aim was to contribute to a more profound understanding of the characteristics of learning environments that are inspired by Vygotskian theories and that are conducive to reading comprehension of informative texts.

Theoretical framework

Sociocultural theory has been influential in educational sciences in the past decades. On the one hand, there are initiatives to conceptualise an overarching approach to answer educational core questions from the perspective of Cultural Historical Activity Theory (Wells and Claxton 2002) and with respect to teaching literacy (Smagorinsky 2011). On the other hand, the empirical research covers a wide range of educational domains. However, to the best of our knowledge, a unified and coherent application of the theory in an educational

practice of a whole curriculum or learning environment is as good as lacking, as is research on such practices. In addition, a Vygotskian approach to teaching reading in actual practice has not yet been articulated in the literature. Although teaching reading is an integral part of all kinds of activities, the research of Vygotskian-inspired practices like dialogic inquiry (Wells 2000, 2002), teaching subject matter (Hedegaard 1999), writing (Dyson 2000) and literature (Miller 2003), has not addressed the theory and practice of the teaching of reading involved.

Reading theory and research is generally characterised by what Smagorinsky (2011, p. 101) labels as "an autonomous view of literacy; one that takes literacy out of its social and cultural context and views it as a discrete skill (…) rather than as a cultural practice". Whereas traditional approaches emphasise the teaching of phonics and other skill-oriented aspects, more recently, reading for meaning is considered to be essential to teaching reading comprehension (Snow 2002). However, most recent approaches consider 'reading for meaning' in a narrow way (i.e. to understand what is in the text). These so-called 'content approaches' are based on models of text processing and emphasise that students construct and integrate the meaning of a text in a coherent whole (McKeown et al. 2009). An innovative content approach, Concept-Oriented Reading Instruction (CORI), which was developed by Guthrie and Wigfield (2000), takes the interpretation of the concept of meaning one step further. The central pursuit of this approach is to foster an in-depth understanding of the conceptual content of the text through the avenue of active engagement of the student. One of the theories that underlie this 'engagement approach' is activity theory. Guthrie and Klauda (2014) take from this theory the view that teaching literacy should be reflective of the cultural context of reading and personally meaningful, and emphasise that teachers should make room for personal connections between teacher and students and amongst students. Collaboration and shared cognitive activity should be a prominent part of the educational process.

The teaching of reading in Developmental Education (DE) in the Netherlands is inspired by both Vygotskian educational theory and the reading approach of the engagement perspective of Concept Oriented Reading Instruction (CORI) (Pompert 2004). Similar to CORI, DE has reading for meaning as its main pursuit, and is a content-based approach that considers reading comprehension as "the process of simultaneously extracting and constructing meaning through interaction and involvement with text" (Snow 2002, p. 11). In the DE learning environment, however, reading activities are embedded in a more general pedagogical approach than CORI and other content-based approaches, comprising the whole curriculum. Moreover, from the Vygotskian perspective that underlies DE, it is emphasised that reading is a form of communication in which cultural meanings (as presented in a text) are connected to personal meanings (sense) of the reader. DE practices include both reading and writing.

In the following paragraphs, we discuss the teaching of reading comprehension in the DE approach. Because CORI has been a source of inspiration for the theory and practice of DE (Pompert 2004), and is well-described (Guthrie and Wigfield 2000), we have used the terminology of Concept Oriented Reading Instruction in defining the characteristics of DE. We firstly introduce the CORI approach, in which engagement/motivation enhancement and instructional components are both central (Guthrie et al. 2007, 2012). Next we discuss how meaningful reading is conceptualised from the Vygotskian perspective of Developmental Education in comparison with the CORI approach.

Components of a learning environment aimed at enhancing motivation

At the core of CORI (Guthrie and Klauda 2014; Guthrie and Wigfield 2000) is the assumption that, in order to engage students in reading, their motivation needs to be enhanced. Guthrie et al. (2007) distinguish five motivational processes: intrinsic motivation, perceived autonomy, self-efficacy, social motivation and mastery goals.

Intrinsic motivation relates to reading for its own sake (Ryan and Deci 2000). It is best fostered in a learning environment that emphasises the *relevance* of the reading activity (i.e. by linking the reading content to student interest and experience, either direct or recalled), and integrating it with their background knowledge. Relevance can be provided in more than one way: a connection between school reading and real life; a focus on student interest (curiosity) and active participation in reading activities; and emphasising that the main purpose of reading is gaining meaning.

Perceived autonomy represents the feeling of control and self-direction. It is supported by student *choice* (of subtopics and texts) and by shared control by teacher and students.

Self-efficacy is the student's confidence that s/he can succeed. It is related to experiencing *success* in reading comprehension, which is facilitated by realistic goal setting and appropriate texts, as well as by frequent feedback regarding successful comprehension.

Social motivation is the feeling of belonging to a group. It is stimulated by *collaboration*, such as reading together and discussions about the text.

Mastery goals are related to the desire for deep understanding. They are promoted by *integration* of reading with (domain) content matter, such as in thematic units, ensuring conceptual coherence across texts and time.

Instructional components of the reading for meaning learning environment

Instructional components of the reading for meaning learning environment that have been identified in the literature relate to texts, reading activities, strategies, instruction, support and interaction, as well as to vocabulary, evaluation and time.

A rich supply of *texts* must be available in order to select appropriate texts for every student: interesting and not too easy or too difficult to read. A variety of *reading activities* and classroom activities related to reading is essential. Reading *strategies* should focus on meaning and meta-cognition (Allington 2002), whereas *instruction* of these strategies should consist in the first place of explicit modeling (i.e. demonstration and explanation of the cognitive strategies used by a skilled reader). The teacher should also explain that the strategies used to help comprehension and gaining meaning. Teachers should take positions among and alongside their students rather than stand in front of the class. Their *support* should consist of scaffolding the strategies modeled (Allington 2002). Teachers must *differentiate* by tentatively identifying student needs for instruction and responding flexibly to them as they read, while adjusting their support to the reader's level. *Interaction* is at the centre of modeling instruction and support during reading activities (Allington 2002). Teachers should encourage students' further thinking and engage them in powerful conversation in class. Collaborative learning structures also foster talk about text and text meaning. Teachers' talk should be tentative, problem-setting and problem-solving, as well as highly personalized, and teachers should use conversation to diagnose student needs.

Furthermore, teaching new *vocabulary* and strategies to discover word meaning are an integral part of reading for meaning. Also, reading for meaning requires a different kind of *evaluation*. Instead of the traditional tests consisting of questions on a text, student work

should be evaluated more in terms of effort and improvement and focus on complex achievements (e.g. thinking) (Allington 2002). As progression in reading comprehension comes from more practice (Van den Broek et al. 2005), it is essential to spend a great deal of *time* on reading tasks (Allington 2002).

A learning environment for meaningful reading from a Vygotskian perspective

Reading for meaning, is considered as "extracting and constructing meaning through interaction and involvement with text" (Snow 2002, p. 11). In CORI, learning environments are created that are meaningful to the students, such as thematic units and inquiry activities, in order to increase both students' concept knowledge and reading comprehension (Guthrie et al. 2007, 2012).

In Vygotskian theory, meaningful learning is interpreted differently. It is seen as the process in which a person becomes personally connected to the cultural world as it has historically developed (Van Oers 2009). Meaning has a cultural and a personal dimension. Making *cultural* meaning is the endeavour to become a skilled and well-informed agent in the cultural world; cultural meaning, however, can be applied and transformed for personal purposes (Van Oers and Wardekker 1999; Mahn and John-Steiner 2002; Smagorinsky 2011). Making *personal* meaning (sense) is the valuation of what is learned from the perspective of a person's own emotions and personal motives (affect). Hence the construction of meaning through reading in a sociocultural Vygotskian perspective entails the reconstruction of cultural knowledge as intended in the text, as well as the association of this knowledge with personal values, interests, emotions etc. (Van Oers 2009). This has consequences for how the learning environment is perceived. Because reading is also conceived as an activity that can bring the wider cultural world into the classroom through the voices of absent others, texts should be chosen that fulfill that function. Because such texts can be difficult to understand, the teacher should supply the tools needed for understanding, such as reading strategies, and scaffold the reading of these texts, as well as arousing questions in pupils that make these texts personally interesting (relevant) for them. The teacher's focus in reading is on understanding, meaning construction and making personal sense.

In Developmental Education, reading activities are embedded in cultural practices across the whole curriculum in which reading is a functional tool for the understanding of texts relevant to those practices. This implies that educational goals for specific knowledge and (reading) skills are related to broader educational goals, such as learning to reflect, construct and use forms of semiotic activity like argumentation, model design and experimentation. Ultimately, agency and citizenship are the main objectives of education. DE seeks to facilitate the development of students' identities as active and responsible participants in society (Van Oers 2009; Pompert 2004; Wardekker 2012).

Students and teachers work on these goals as a community of learners. In DE, all content and learning activities are organised in thematic units, with the aim of reconstructing a sociocultural practice inside the school walls, such as establishing an exhibition or a museum in the classroom, setting up a commercial company, or working in a science laboratory. For every thematic unit, a new physical learning environment is created in the classroom that represents the sociocultural practice in both its physical and symbolic aspects. This environment is presented in its final form to a public consisting of parents, other groups of students or potentially an audience from outside the school. Recurring elements of the physical learning environment in the classroom are the 'question wall'

(displaying students' questions), the 'vocabulary wall' (displaying new vocabulary), the 'book table' (containing a large supply of resources) and the 'reading board' (displaying texts read collectively). Objects created by students or brought in from home are also part of the learning environment. Students have at their disposal the classroom as well as other parts of the school, such as hallways or patios. The learning environment is usually extended by inviting a professional expert into the classroom (e.g. a researcher, a 'Roman' or a street sweeper) or by an excursion (e.g. to an observatory or the ruins of a Roman temple in the neighbourhood). Reading is rendered meaningful and functional in the context of the students' common purpose of participation in sociocultural practices. An inquiry-oriented learning environment is created in which reading is driven by students' questions, making reading personally meaningful (based on interest, motives) and functional (answering student's questions). Hence, ultimately, the meaning of this learning environment is the environment as perceived by students through the prism of their personal interests and emotions (see Vygotsky 1994). Within such environments, students are encouraged to wonder, think and pose questions which are the starting point for searching for texts and drawing information from texts, thus creating a need for students to become engaged in processes of reading comprehension.

This study

The theory of CORI postulates that, to make reading meaningful for students, teachers should engage their students and enhance reading motivation through a learning environment that involves relevance, choice, success, collaboration and integration. Because the DE approach is based on sociocultural theory, the question arises as to how the sociocultural interpretation of meaning plays out in the learning environment, and whether and in what way relevance, choice, success, collaboration and integration occur in DE classrooms.

In this study, we examined the DE learning environment aimed at teaching to read informative texts. We aimed at gaining more insight into how teachers organise the learning environment so that the reading endeavour becomes personally and culturally meaningful for their students as a way to improve participation in cultural practices. The main challenge was to grasp the creativity and agency of teachers of Developmental Education in making reading of informative texts meaningful to all students. The research question was: What are the characteristics of a learning environment for reading comprehension of informative texts, based on a Vygotskian approach of meaningful reading? As schools generally start teaching 9–10 year old students to read informative texts (Snow 2002), we conducted our study in grade 4.

Method

A multiple case study design was used to investigate whether and how learning environments for meaningful reading in DE reflect a specific sociocultural interpretation of 'meaningful'. Case studies are suitable for investigating a phenomenon within a real-life context (Yin 2002) and for providing insight into complex processes, such as the classroom enactment of the instructional and motivational components in this study. Because enactment can vary between teachers and classes, we have included five cases in the study.

Participants

The study was conducted in four schools where the DE approach had been implemented for an extensive time and among various student populations (urban-suburban; higher-lower SES; ethnic-culturally homogeneous-diverse). In these schools, five fourth-grade teachers participated voluntarily in the study. We selected teachers with a minimum of two years of experience in teaching DE in the upper grades. Below we provide brief descriptions of each of the participating teachers.

Marcia taught grade 4 at an urban school in the centre of the country's capital. Her group consisted of 22 students, of whom more than 90 % were native students from high/middle SES parents. She characterised five of them as readers having relatively 'high needs' for instruction and support, including two non-native speakers. (By non-native speakers, we mean students whose parents speak a language other than Dutch or a combination of another language and Dutch.) Marcia had five years of experience as a teacher, all in Developmental Education. During our study, Marcia worked on a theme called 'The Romans'.

Maureen taught a combination of grades 3 and 4 at a school situated in a newly-built area of a town's suburb. Her group consisted of 24 students (15 in grade 3 and 9 in grade 4). Approximately two-thirds of the students in each grade had high/middle SES parents, whereas one-third came from families with low SES. All the students were native speakers of Dutch. Maureen had eight years of teaching experience in Developmental Education. She was also working as a teacher educator of DE in the upper grades. After teacher training college, Maureen had obtained a Master's degree in pedagogy. During our study, Maureen worked on a theme about space.

Cynthia taught a combination of grades 3 and 4 at a school situated in an older suburb of the same town as Maureen. Her group consisted of 21 students, eight in grade 3 and 13 in grade 4. All students came from high/middle SES families and were native speakers. Cynthia characterised approximately a third of her students as having relatively high needs for instruction and support, mostly related to problems of behaviour. Cynthia had more than 11 years of experience, all of which was in schools for Developmental Education. During our study, Cynthia worked on the same theme as Marcia: 'The Romans'.

Leo taught grade 4 at a multi-ethnic school in the country's capital. His group consisted of 21 students, all from low SES parents. Only eight students were native speakers of Dutch, of whom three were native Dutch and five were Surinamese/Antillean students. 11 students were non-native speakers from various cultural backgrounds. Leo had 25 years of teaching experience, including 10 years in Developmental Education at this school. During our study, Leo worked on a theme called 'The Environmental Brigade'.

Nathalie taught at the same school in a parallel grade 4. Her group consisted of 20 students. All but one came from low SES families. Students had various cultural backgrounds. Ten students were native speakers of Dutch, five of whom were native Dutch and five were Surinamese/Antillean. Nathalie had 2.5 years of teaching experience, all in Developmental Education at this school. After teacher training college, she had obtained a professional Master of Special Educational Needs. During our study, Nathalie worked on the same theme as Leo.

Data collection

Data collection took place over a period of six to eight weeks for each teacher, corresponding to a current thematic unit. It consisted of observations, interviews and document analysis, and focused on how teachers fostered reading for meaning from a sociocultural point of view. Classroom reading instruction and reading activities were videotaped three times. Moments for video-observation that would show how each teacher created a learning environment for reading were selected in consultation with the teachers. Teachers were asked to conduct their lessons as usual. Over six hours of video recordings were made for each teacher.

Teachers were interviewed five times: at the start of the thematic unit, immediately after each classroom observation, and at the end of the thematic unit. The interviews were face-to-face and semi-structured. Teachers were asked to elaborate on how they stimulated reading motivation, how they provided meaningful strategy instruction and small-group support, and how reading was connected to other inquiry activities, especially to writing. Furthermore, we asked the teachers how they differentiated instruction with respect to student interest, prior knowledge, vocabulary, reading level and home culture, and how the selection of meaningful texts took place. We also asked them about their ways of evaluating student development in reading comprehension. Teachers were explicitly invited to share their opinions about the benefits of the DE approach and to signal needs for improvement of the DE framework.

In addition, we collected documents, such as teacher preparations, journals and evaluations, reading texts, research questions and texts written by students, as well as documents describing the school's reading curriculum.

Data analysis

Teacher interviews were transcribed verbatim and coded with software for qualitative data analysis (Atlas.ti version 6.2). Classroom observations and documents were used for triangulation. To ensure data validity, we sent the transcriptions of the interviews, as well as a within-case description, to the participating teachers to verify whether we had correctly interpreted their words. The teachers stated that they recognised their reading practices in the descriptions.

For the first instance of coding, we designed a coding scheme consisting of the instructional and motivational components drawn from the reading for meaning and CORI research base (Table 1). We assumed that these components would provide a valid coding system for discovering complex processes, such as the enactment of motivation enhancement within instructional practices of reading comprehension, especially because the theory of practice of DE is explicitly inspired by the engagement perspective.

Coding was a recursive process during which we added concepts relevant to the framework of sociocultural theory and DE theory of practice in memos attached to relevant quotations in Atlas.ti (Table 2).

Memos helped the researcher to think about which code to assign to a quotation or about creating a new code. Measures of reliability of the coding process consisted of an audit trail performed by three fellow researchers, who were experts of Developmental Education. They recursively checked samples of coded quotations, and the research team discussed questions and hesitations from memos that had been written during the coding process. Finally, decisions were made jointly on criteria for the final coding.

Table 1 Coding scheme: codes and descriptions of the motivational and instructional components of reading for meaning

Codes	Description
Motivational components	
Relevance	The reading content is linked to student interest, experience, and prior knowledge
Choice	Student choice of subtopics and texts as well as shared control (by teacher and students)
Success	Realistic goal setting, appropriate texts, and positive feedback regarding comprehension
Collaboration	Reading together and talking about text
Integration	Reading is integrated with domain content matter and linked to other activities
Instructional components	
Text	Providing an abundance of interesting, appropriate texts
Activity	Providing a variety of reading activities and activities related to reading comprehension
Strategy	Teaching reading strategies, focusing on metacognition
Instruction	Strategy-instruction using meaningful texts
Support	Guided reading and small-group support
Differentiation	Teacher's adjustment to reading level and estimation of high/low needs for instruction
Interaction	Classroom talk and teacher-student dialogue
Evaluation	Registration of reading development
Time	Ample time on reading task
Vocabulary	Introducing new words and vocabulary strategies

Table 2 Example quotation, coded, and with attached memo

Quotation	Code	Memo
Teacher Marcia: "We have formulated questions and these questions show that they want to know how it all started in the Roman Empire, they are all very curious to know now. And when you introduce such a text (on Romulus and Remus), it will stick to them much longer than a text about a vegetable garden, or whatever, that doesn't correspond at all to what they are in for at this moment"	Relevance	Inquiry based learning environment Students' questions Text read for instruction corresponds to all students' interest

After coding, data were displayed for each case in an initial matrix, with quotations and memos listed for each code. For example, for teacher X, all quotations coded with 'Relevance' were selected, followed by all quotations coded with 'Choice'. For this initial matrix, we used the Atlas.ti co-occurrence tree explorer. Because of the interrelatedness of the instructional and motivational components in classroom practice, several codes co-occurred.

Next, the quotations in the cells were reduced by condensing, summarising and packaging until further reduction was impossible without loss of significance and the essence was reached. In this process, the condensed content was regularly verified in the original data. This was a recursive process, performed within-case for every teacher individually. The successive stages of reduction were saved in separate files and discussed for audit trail with the fellow researchers. Parallel to this systematic but fragmented procedure, we

developed a more coherent picture of the cases reflected in a thick-description narrative of every case individually.

Data thus reduced were displayed in a second matrix for cross-case analysis, aligning the cases in rows and the codes in columns. Patterns were determined across cases using Atlas.ti's co-occurrence table. Components that were aimed at enhancing motivation appeared to be predominant and were strongly interrelated to instructional components. The presentation of the results is therefore organised in terms of the motivational components, embedding the findings on how the instructional components were enacted. Emerging patterns were verified by going back and forth between the descriptions, reduced data and the original data. In determining patterns, we also looked for differences that could exist between DE teachers in their enactment of meaningful reading and for plausible explanations of these differences. Again, an audit trail was performed by the three fellow researchers.

The thick descriptions quickly revealed a cross-case pattern that disclosed three phases in reading activities (see the paradigm case in the "Appendix"). This was confirmed by the teachers when they checked the description of their practice.

Results

Before we discuss how a learning environment for meaningful reading is created by the DE teachers, we provide a description of one of the teacher cases, Maureen, who is a very proficient teacher and whose practice gives the most complete picture of meaningful reading in Developmental Education. See the "Appendix" for a description of this paradigm case. As the way in which a sociocultural interpretation of meaningful reading forms the DE learning environment became visible most clearly in our analysis of the motivational components of the learning environment, these components structure the presentation of our findings. The instructional components are addressed in the context of the motivational components. Every section starts with an example from the paradigm case.

Relevance

> Michael brought in a newspaper article on a Dutch astronaut who will soon leave on a mission. A student says: "Maybe we can interview him before he goes into space!" Other students agree and forward their ideas for questions. Teacher Maureen asks: "Who will write down our questions?"

In the paradigm case of Maureen (see the "Appendix"), the space laboratory represents an interesting sociocultural practice (SCP) for the students in which they will be 'real' astronauts. In this context, reading the newspaper article on the Dutch astronaut is highly relevant; it evokes student interest as well as their emotions (identification) and initiatives. The teacher seizes the opportunity to connect it to meaningful writing activities. In the other cases, the SCPs corresponding to the themes are a Roman museum and an environmental brigade. SCPs provide an occasion and purpose for students to participate in real-life situations. This reflects the difference between meaningful reading in DE and the CORI approach. Meaningful reading based on CORI aims at acquiring conceptual knowledge of subject matter, whereas DE aims at learning for improved participation in

society, with the help of communication (reading and writing) and connecting new cultural meanings to personal interests and values.

Another aspect of DE is that the teacher tries to draw out student emotions and deeper personal motives (affect). Maureen evokes emotion and identification by discussing a video of a boy launching a rocket and reading a story of a little dog in space. Likewise, she appeals to emotions (and fantasy) by the writing assignment 'my journey into space'. Maureen enhances personal meaning from the start of the project. She incites students' curiosity and engages them by proposing a variety of activities on the thematic content, such as hands-on experiences in the space laboratory and examining illustrations of satellites. In combination with classroom conversations on short reading texts and children's questions, she thus (teacher's quote) "prepares a bath of relevance". Reading is not only integrated with interesting content, but always embedded in a sequence of activities. Maureen takes a student's question as the starting point for every activity. She emphasises that reading is a way of communicating with absent agents, answering questions and enabling performance of the next activity.

Taking relevance as the central point for teaching reading implies that the teacher maintains relevance during the project for all students. To that end, teachers employ ways of instruction (such as classroom discussion, small-group activities), when relevant for the activity and experienced as such by the students. In the paradigm case, as soon as Maureen noticed a student's loss of motivation, she tried to restore it, referring to personal meaning by asking: "What is your question? What is your goal?" She maintained relevance by emphasising the functionality of reading because it enables students to participate more effectively in the space laboratory. To that end, she also applied dynamic classroom management, alternating expert group work with classroom conversations in which groups reported on their questions, their findings and what they still needed (to know) for their contribution to the SCP.

In the other cases, the teachers proceeded along similar lines. They fostered relevance before introducing reading, and they enriched relevance by participation and affect. But the teachers maintained their own style. For example, Marcia had her students choose a Roman name that she translated into Dutch, and a Roman profession or craft before asking them to look for information to write on 'A day in the life of a priest, a blacksmith, a soldier'.

The Roman name helped the students identify with the subject, thus making reading about Roman daily life meaningful to them. Marcia also invented playful reading activities, such as quizzes, puzzles and games with dice, thus creating occasions for students to apply a reading strategy that she had modeled. She even staged short drama performances in which small groups acted out the essence of a paragraph, unaware that they were practising a reading strategy (summarising). Leo and Nathalie organised a spectacular start-up activity, having students participate in the work of the local environmental brigade that cleaned the streets. Cynthia provided creative hands-on activities for almost every reading text, explaining in an interview that meaning is "the essence of the real job" (i.e. learning). She emphasised that she needed student ideas to design the project.

There was yet another pattern of strategy instruction. Teachers provided reading strategies when students needed them for understanding, and so related the use of a strategy to students' interest and background knowledge, thus increasing relevance. The teacher from the paradigm case was flexible in providing reading instruction. The other teachers planned instruction when they found a text that was interesting for all students but required the teacher to model strategies to be understood. All the teachers seemed to have developed a special 'antenna' for signals of involvement and interest among their students. They never delivered instruction over the heads of their students, but made sure that texts were

meaningful. For example, Marcia and Cynthia chose a text on Roman history from an 'ancient newspaper'. Cynthia had even made the paper look ancient, suggesting to students it was an authentic Roman newspaper.

In sum, we have seen how the meaning of relevance is broadened in DE. Relevance is fostered, on the one hand, by student participation in SCP as a context calling for cultural meaning and, on the other hand, by the teacher addressing emotion and motives for personal meaning.

Choice

> Dennis is interested in space crafts. He brings from home a Technical Lego space invader that he has constructed himself. He wants to show it to the group and talk about its functions.

Teaching meaningful reading implies providing students with a choice of texts. In DE, however, shared control and autonomy support go further than choosing texts. By encouraging students to bring materials and texts of special interest to them, the teacher creates, together with the students, a rich supply of interesting materials and texts related to the theme. By encouraging students to share their knowledge, ideas and questions in classroom discussion (sometimes with self-written texts), she helps students to understand that there is choice, and allows them to co-determine the course of the classroom activities.

Teacher Maureen promoted that students choose texts corresponding to their questions (interests). If they choose a text that is difficult to understand, she applies guided reading or small-group support. If students choose a text that is too easy for them, she encourages them to choose a more challenging one. The choices provided by Maureen encouraged students to read several texts and spend much time reading, thus applying reading strategies frequently.

We found the same pattern of providing text choices, shared control and autonomy support with the other teachers, although to different extents. Whereas the teacher in the paradigm case had her students choose their texts across the project and read all the texts herself, the other teachers tended to provide more texts themselves, especially during the orientation phase of the project, with texts for instruction generally being the teacher's choice. They also seemed to be more directive in guiding student choice during expert group work, ensuring that texts not only corresponded to student interests, but also to their reading level. This suggests that only very proficient DE teachers manage to fully exploit possibilities for shared control and autonomy support, which are important for personal development and active, responsible participation in the culture.

Success

> Less skilled readers can be engaged by experiencing small-scale successes when retrieving answers to their questions, when going through a text and getting enthusiastic about what they find out. (Teacher Maureen in an interview)

Maureen was very alert to student success in reading. She focused on identifying individual students' Zone of Proximal Development, using frequent conversation to diagnose what students could already read independently and where they needed support. She read all the texts chosen by students to anticipate difficulties that individual students might encounter when reading their text.

Maureen strongly differentiated among students to foster success. She showed skillful adjustment to reader needs in her guided reading of the news article on the Chinese space laboratory, as well as in scaffolding reading strategies in small-group support. To encourage success in less-skilled readers, she planned her scaffolding support to specific students in her journal. In addition she created challenging activities for stronger readers.

Moreover, her dynamic organisation of reading activities (using a kitchen timer) contributed to success: for example, when dealing with a child's question of whether there is life on the moon, she organised successive short activities, such as forwarding arguments pro and con, listing them schematically, followed by reading texts to check their validity. Maureen not only applied, but exceeded Guthrie's conditions for success, which consist of enhancing self-efficacy by providing appropriate texts, realistic goal setting and positive feedback on successful comprehension. In DE, fostering success in understanding is enhanced by differentiation, by teacher focus and skill to assist students in reading texts meaningful to them beyond their actual individual capacities. In addition to students' successful understanding from text, mostly reported in written text, its use as newly-constructed knowledge for the entire classroom community is valuable.

The focus on successfully understanding text content was found for all teachers whom we studied. Without exception, they used conversations with students for diagnosis and identification of their new learning needs and provided reading instruction and support flexibly (i.e. when required for student understanding). Marcia showed great sensitivity to student engagement and flexibility, switching to whole-group instruction (modeling) when students were no longer engaged during a small-group activity (which she interpreted as a signal the activity was too difficult). Cynthia focused on results among less-skilled readers and those having concentration problems: She engaged her students in reading activities that they could perform successfully, enabling them to make small progress steps in development. To do so, she applied differentiation at reading level as well as for content.

The teacher in the paradigm case was the only one using a journal to systematically plan and evaluate her scaffolding support of specific students. The other teachers reported in interviews that they could not find the time required for systematic registration but relied on their knowledge of the capacities of their students from conversations to apply differentiation.

Student progress was evaluated with the students personally, but also extensively commented upon in student portfolios in which areas for special attention were indicated (formative evaluation). In the interviews, teachers valued this kind of evaluation more than student achievement on regular tests. Portfolios served as showcases for students on the one hand, and as reports for their parents on the other. Teacher Maureen processed very systematically, teacher Cynthia used texts written by students for her evaluation. The other teachers, however, hardly used these, but reported in interviews that they kept things in mind.

Collaboration

> Elsa is the 'owner' of the question about life on the moon; therefore she takes the lead in the classroom conversation about this subject. Teacher Maureen shows real interest, listening attentively to every student's ideas and arguments.

Maureen created a community of inquiry in which students were active participants and she was a partner. When students needed support, she became a more knowledgeable partner, but was an equal partner when students were able to understand text in

collaboration with peers. When adopting the role of an equal partner, Maureen shared control, encouraged students to address each other directly, and stimulated their initiatives and their ownership of questions. This role is also reflected in her tone, which is always conversational, and by her talk, which is tentative and often problem-setting. She demonstrates that she does not know all the answers herself. She stimulates student thinking by asking higher-order questions such as: "How can we find out?" Frequent classroom conversation about (expert group) questions, answers and texts inspired students to share interesting texts with others and reflected collaboration of the entire community to participate in the sociocultural practice of the space laboratory.

In the literature on the CORI approach, collaboration does not necessarily include the teacher in a community of learners. It refers mainly to collaboration between peers and is considered as a way to enhance social motivation. In DE, however, collaboration is more than enhancing social motivation for reading; interaction with others (including the teacher) and participation are key for making sense and meaning. In the paradigm case, Maureen brought frequent changes to small group composition and size "to get to know each other in different ways", as she stated in an interview. She described the essence of reading as follows: "A person reads to find an answer to questions and discuss it with others", thus presenting reading as a part of a communication process.

Communication with others is crucial in DE, and students communicate with authors as absent partners. The teacher also stimulates them to communicate among themselves by encouraging students to think and express their thoughts and ideas in conversation, as well as by making them put into words their ideas and understanding in written text. By valuing individual student questions, she contributes to their development.

All teachers in our study organised many collaborative reading activities. They also encouraged collaboration in classroom conversation, although there was a clear pattern of collaboration being most intense in expert group inquiry. All DE teachers created a community and adopted the role of partner, although to different extents. The teacher in the paradigm case adopted the role of equal collaborating partner in small-group support as well as in classroom conversation. Other teachers generally adopted the role of more-knowledgeable partner, especially during small-group support. Teachers Maureen and Marcia were remarkably skilled in classroom management, bringing frequent changes to small-group composition and size.

These differences could have been because of group composition: Leo and Nathalie had multi-ethnic classes and showed more directive behaviour in group composition. In an interview, they explained this behavior: Students' home cultures would lead them to expect leadership and authority from the teacher and discourage them from taking initiatives. Teacher Cynthia was also more directive in group composition. She explained that it enabled her to ensure that every student made progress, because a relatively high number of students in her class had behavioural and learning disorders.

Integration

> Every activity in this classroom is an activity in which students talk, listen, read and write. (Teacher Maureen)

In the CORI approach, integration refers to the instruction of reading strategies being integrated in subject-matter instruction (i.e. associated with texts that students have to read). In DE, however, integration has an extra dimension: *all* classroom activities, including reading, are centred on the theme of the sociocultural practice, making subject

matter meaningful. In the paradigm case, the space laboratory was the means for integrating all activities, including activities aimed at broad goals, such as experimentation and model design. Students read instructions (in order to perform experiments) and informational texts (in order to design an experiment on solar energy or a satellite).

Consequently, reading comprehension is not isolated as a separate matter and reading strategies are not treated as an isolated goal (systematically sticking to a timetable), but are an integrated part of the activities (a tool for making sense of texts and practices). In the same way, vocabulary acquisition is completely integrated. In the cases studied, teachers introduced new vocabulary into the theme in a variety of ways and adjusted to student needs. In the culturally mixed schools, a great deal of explicit attention was paid to vocabulary, along with games and quizzes in which students had an active role. In all cases studied, words were visualised on the wall.

Full integration of all activities around content in DE enabled the teacher in the paradigm case to create a great deal of time on task for reading. Teachers estimated the time spent on reading as being 25–50 % of the school day, depending on the nature of the theme. Lesson plans did not provide enough information to verify this, but showed that reading was the major source of information for inquiry.

Another aspect of integration in DE is the close connection among all types of language activities, which are considered forms of communication: talking, listening and, particularly, reading and writing. In the paradigm case, the connections between reading and writing were frequent and logical; for example, in a series of short reading and writing activities, students wrote down their trial answers, which were later discussed in the classroom. In an interview, teacher Maureen explained: "Writing is a way of understanding what you have read." Reading and writing are functionally embedded in other activities. In the space laboratory, students first read to be able to perform an experiment, next they performed the experiment, and then they described it to inform others.

Through cross-case analysis, when comparing the paradigm case (Maureen) with the other DE teachers, we discovered similar patterns. All teachers connected reading and writing activities; writing not only followed reading, but also preceded reading. However, the teacher in the paradigm case connected reading and writing more systematically and in more different ways than the other teachers.

Conclusion and discussion

In this study, we wanted to gain insight in learning environments for meaningful reading in Developmental Education (DE), a pedagogical approach based on Vygotskian theory. Below we present our conclusions about the characteristics of such learning environments in terms of the motivational components of the DE learning environment. *Relevance* is clearly the most central of all motivational components in DE, but the interpretation of *relevance* could be qualified as broader than in the CORI approach of reading for meaning (Guthrie et al. 2007). Rather than using (hands-on) activities as a means to motivate students to acquire reading skills and knowledge, DE aims at reading what is relevant because it is a functional way of communication in the sociocultural practice that materialises the theme on which the students are working in a real-life learning environment. On the one hand, it is functional for students' participation in a culturally-meaningful practice; on the other hand, the reading should meet students' deeper personal motives, values and emotions (thus broadening the relevance for personal meaning). This

corresponds to Smagorinsky's (2011, p. 103) view of reading that "inscribing oneself in a text (…) enables access to content and material for generating meaning". It involves complex thinking, and can contribute to identity development. All DE teachers in this study aimed at ensuring that the texts used were personally meaningful to the students. Teachers seized opportunities for instruction and support when a strategy was needed for understanding, thus providing meaningful strategy instruction. Also, DE teachers seemed to have developed over the years a special 'antenna' to detect signals of involvement and interest by their students. This focus seemed to entice them to maintain relevance for all students in the course of the project.

In CORI, *Choice* refers to sharing control and supporting student autonomy in reading. In DE, however, shared control and autonomy support go beyond choice of texts. All teachers in this study allowed students to co-determine the course of the classroom activities, so that students would feel that their interests were valued. In this way, teachers not only stimulated students to read texts, but encouraged their personal development; by choosing subjects and texts of interest, students learned about the subject matter and about themselves. Students were also allowed to read frequently and for longer if they wanted to. This enabled students to apply strategies frequently. Although all DE teachers provided choice of text, they did so to different degrees. An explanation of the differences could be that providing choices of texts puts high demands on teacher competence because it entails different students reading different texts.

In DE, teachers aim to foster *success* by assisting students when reading texts that go beyond their actual level of reading ability. DE teachers in this study frequently used conversations to gain insight into students' reading levels, motives and needs. This would enable them to determine whether a text was appropriate for student reading levels and to provide strategy instruction and support when needed for understanding. In this way, teachers can raise students' reading level to their potential. This is the core of the Vygotskian concept of 'zone of proximal development'. It reflects Smagorinsky's (2011) view of expert teachers who make decisions locally and relationally based on careful and systematic observation of students. Smagorinsky (p. 108) considers this "situated action (…) at the heart of a Vygotskian approach to literacy instruction". Dynamic switches between instruction and support necessitate strong classroom management skills. Systematic registration for planning-adjusted scaffolding and evaluation was found only with one teacher. Other teachers had difficulty in finding the time needed to register systematically.

Collaboration usually represents small group work (enhancing social motivation) and classroom talk. All DE teachers in our study organised a great deal of collaborative reading activities and discussion about text. In DE, collaboration ultimately represents interaction and participation of teacher and students together in a community of inquiry, investigating meaningful questions together. Collaboration interpreted in this way is considered to contribute to agency and citizenship (by participation in sociocultural practices). Teachers and students engage in what Mercer and Littleton (2007) describe as 'exploratory talk' in collaboration. In doing so, they learn to use a text as a 'thinking device' and generate 'new understanding' that is superior to the previous understanding of everyone involved (Wells and Mejía-Arauz 2006). Teachers in this study generally adopted the role of a more knowledgeable partner, especially during small-group support. Here also there were differences among teachers that could be explained by varied mastery of teaching skills, but also might be related to the student group's composition. One teacher in a multi-ethnic school reported that he had become more directive in small-group composition over the last years, because students in his group took few initiatives in collaboration. He supposed

that there was a conflict between the school culture of asking students to take initiatives, and the home culture which often is more authoritarian (Pels and Nijsten 2006). Similarly, another teacher with a relatively large number of students with learning and behavioural disorders was also more directive in group composition. She explained that it enabled her to ensure that progress was made by every student.

In DE, *integration* also goes beyond the CORI approach in which it means that instruction in reading strategies is integrated in specific subject matter instruction (science, history or literature). All teachers in our study fully integrated reading and reading instruction in thematic, content-based inquiry activities that were contextualised in a sociocultural practice and connected to a number of cognitive domains. Teachers thus created opportunities for students to engage their interest, feelings and values as well as their cognition (Wells 2002). Reading was promoted as an act of communication (among other language activities such as listening, talking and writing) that was consistently directed at the investigation of meaningful problems. The teachers provided instruction in reading strategies and introduced new vocabulary flexibly as it was needed for student understanding. In this way, reading was a fully integrated, functional and indispensable activity.

Our analysis of the way in which reading comprehension of informative texts is approached in DE provides insight into the characteristics of powerful learning environments for reading comprehension inspired by a Vygotskian approach. The analysis helped to clarify how teachers create a learning environment in which the teaching of reading becomes personally and culturally meaningful for students as a way to improve participation in cultural practices. Although reading for meaning usually refers to helping students to relate to the reading content, in DE, meaning is the driving force for all learning. It requires intellect, action and also emotions aimed not only at the construction of knowledge, but also at the development of the whole person through participation in historically-situated, jointly-undertaken activities that are personally significant and socially meaningful.

There were differences among teachers of DE. Although all DE teachers focused on reading for meaning from a sociocultural perspective, they each had his/her own style, talents and difficulties. Contextual factors in the learning environment, such as student group composition, also could influence teaching meaningful reading. Nevertheless, all experienced DE teachers in our study managed to teach reading (strategies) in a functional, meaningful way, aimed at helping students understand why they learn reading strategies and what these strategies enable them to do. We only found slight adaptations of the approach towards multi-ethnic groups and children with special needs. This makes it plausible to think that teachers of DE are led above all to respond to individual students' needs and opportunities for development. In doing so, teachers' practices are in line with Vygotskian theory, in which students' zone of proximal development is leading for educational strategies.

All this leads us to conclude that teachers of DE are focused on maximising meaning from text for their students. It could be evident that creating a learning environment for meaningful reading from a sociocultural perspective puts high demands on teacher competence. As already stated by Allington (2002) and Smagorinsky (2011), reading for meaning can never be implemented by only carrying out a set of instructional methods. Teachers not only need to have a good overview of the curriculum content, but also resourcefulness in the design of both learning activities and the learning environment. Moreover, teacher qualities, such as flexibility, dynamic class management skills, sensitivity and skilled adjustment to student needs, are paramount for teaching reading

comprehension in DE across the curriculum. But most of all, teachers must have the courage to have confidence in their judgements of their students' needs and in their capacities to meet these needs and to share control in order to embed reading in the sociocultural practices which are meaningful to their students. These teacher qualities could be strong determinants of proficiency in DE and for creating learning environments in primary schools that promote the development of reading for meaning in all students.

The findings of the present study could have implications for initial and inservice teacher training, not only for DE teachers but perhaps also for other educational approaches. The creation of learning environments that contribute to the process of maximising meaning from informative texts demands more than being proficient in teaching reading as a discrete skill. It encompasses attitudes and qualities that make teachers able to, as teacher Maureen called it, "prepare a bath of relevance" when teaching reading. This study shows how expert teachers manage to achieve this goal and give shape to reading as a cultural practice within their classrooms.

This study had some limitations. Firstly, our research required a small sample and a selection of expert teachers. This limits the generalisability of the findings, however. We have not been able to research all schools of Developmental Education in the Netherlands, and there could be teachers who are less successful in bringing DE principles into practice. Like Smagorinsky (2011, p. 108), we are "not taking the romantic view that all teachers are wonderful", although teachers who opt for DE deliberately aim at a reflective practice as presented in this paper. In addition, we have only been able to observe the learning environment in each classroom during a limited number of sessions of reading instruction and activities.

A second limitation is that we did not investigate actual student learning and learning outcomes. There is evidence that learning environments aimed at enhancing motivation have a positive effect on understanding text and on learning outcomes (Guthrie et al. 2007). A pressing question for future research is whether DE, through maximising meaning in reading by enriching the construct of 'meaningful', also enhances reading motivation and reading achievement and, by extension, whether this approach brings about broader educational goals such as learning to reflect, argue and experiment. The greatest challenge for future research, however, is whether the DE approach, with its emphasis on making meaning, contributes to the ultimate goal of supporting agency and citizenship among students.

A related question for future research is whether the DE approach has differential effects on the reading outcomes of students with various backgrounds. Policy makers assume sometimes (Tesser and Iedema 2001) that innovative approaches like DE are suitable for students whose parents are well-educated native speakers of the language of instruction in school, whereas students from families with a different ethnic-linguistic backgrounds or lower socioeconomic levels would benefit more from a more-programmatic approach. The assumption is that these students most need standardised structure and instruction. But it is still an open question as to whether the dynamics of maximising meaning in the teaching of reading that underlie the processes of the activity approach could equally contribute to successful learning environments for all students.

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Appendix

Paradigm case

The theme in Maureen's classroom is called: 'Give me space!' For seven weeks all learning activities are centered on the galaxy, planets, and space shuttles. Maureen defined a number of developmental (broad) goals: experimentation and model making. The description below follows the three successive phases typical of a theme.

Orientation phase: starting activities

Teacher Maureen introduces the thematic activity: "We are going to set up a real space lab in our classroom. There we can experiment to find out more about outer space, just like real astronauts." In the discussion circle, students tell about what they already know on the subject and their personal experiences. Together, they create a concept map.

Maureen has already set up some test installations to conduct experiments on gravitation, upward pressure, and change of air pressure. The space lab will be further equipped by the students. In order to conduct the experiments, students read the informative texts accompanying the installations, while talking about outer space and space travel. In doing so, students already use some specific vocabulary and come up with ideas and questions, like: What are astronauts doing in a space lab? How does a rocket work? Is there life on the moon? These and other questions are discussed in the circle, as well as some illustrations of satellites and a Hubble telescope. The class also watches a video that shows a boy launching a rocket and explaining how it works. Students are impressed. They also read a story about the little dog Laïka traveling into space. In the following classroom discussion, students fantasize about going into space. Next, they write a fantasy story about their personal journey into space. When finished, students read each other's texts and give advice on the application of writing strategies.

As students become more interested in the subject, they bring objects from home to the space lab, as well as newspaper articles and books they want to show. Many texts are thus brought to the classroom. In the course of days, planets and space travel are the subject of students' presentations to the class. Student questions are posted on the Question wall. Meanwhile, text reading serves for elucidating students' questions. Sometimes teacher Maureen needs to delve into books herself.

A lively full class discussion is held about Elsa's question whether there is life on the moon. Maureen listens with interest, thinks along, and expresses her understanding of what students say. She does not give any answers herself nor does she judge student views. Instead, she draws other students into the discussion or asks a question. In the end, she visualises all the arguments on the whiteboard in two columns: 'life' versus 'no life' on the moon. She says: "This is what we think now. But we need to know for sure. How can we find out?" Some students go straightaway to the book table.

Now that her students are motivated to read texts to search for answers, teacher Maureen considers the time is right for instruction of the strategy of text selection. Jody wants to know whether there is food on the moon. The teacher models how she proceeds to decide whether a text is appropriate: "Let's see, is this about food? No, it is not about food." When she notices that many students are already familiar with text selection, she quickly changes her plan: In pairs, students get the assignment to select texts that may contain answers to their questions, while the teacher herself remains at the disposition of

students needing support in performing this strategy. In the ensuing small-group conversations Maureen asks questions to diagnose what students can already do without help and when her support is needed.

As soon as all students have found appropriate texts, the teacher assigns a sequence of short collaborative reading and writing activities (using a kitchen timer) directed to finding answers to their questions. In pairs, students first clarify their questions and make a list of what they already know on the subject. Next the lists are exchanged and completed by a few other students. Then all pairs read their own text, mark keywords, and write down a trial answer. After the trial answers have been commented on by a few other pairs, they are discussed in the discussion circle. Two weeks later, the Question wall is filled. Students are now aware of what they really want to find out in the space lab.

Elaboration phase: inquiry activities

Now students will perform their inquiry in expert groups, based on shared interest. Some expert groups are especially interested in constructing a satellite or a space shuttle (model making). Other groups want to design experiments to generate solar energy, discover the functioning of a GPS, or calculate the distance to the moon (experimentation).

The expert groups explore the large supply of resources containing a mixture of easier and more difficult texts to read, aiming to find texts that answer their questions: What resources do we have? Which texts are convenient? Using post-it notes, they mark texts that may be useful to them or interesting to another expert group. That evening Maureen reads and makes copies of the texts selected by the students. From her knowledge about her students, she can tell which students will find it difficult to read the text of their choice, and in her journal, she plans to support them.

The next day the expert groups read together the texts copied for them, looking for answers to their questions. Maureen regularly goes around and enters into conversation with students about their thinking, ideas, and questions. In this way she scaffolds reading strategies flexibly. When students want to read a difficult text, such as a newspaper article on a Chinese space station, Maureen joins in. She suggests applying the reading strategy scanning, and students express their ideas about the text: “So they (the Chinese) want to have their own space station. Why would they want that?” And then: “Oh, there is something about money here, oh yes!” Talking and thinking aloud together, helps make the text comprehensible. In this conversation, the teacher is diagnosing student use of strategies, and provides positive feedback on their text comprehension.

Maureen challenges a few good readers to investigate the historical background of space travel by reading a few interesting but difficult texts about famous inventors. The students write a summary to inform the whole class.

Once the expert groups have found answers to their questions, it is evaluation time. In the discussion circle, students talk about their inquiry: these were our questions, these are the answers we have found. Maureen always asks: “Tell us, how did you find those answers?” It makes students talk about the text, about text features and the impressions they got from the texts. Students write down their answers in texts that then serve as newly acquired knowledge.

Texts are not the only resources for checking the accuracy of student ideas. An expert is invited to talk about his work as a researcher and the entire class goes on an excursion to an observatory nearby.

After a while the expert groups are sufficiently informed to perform their experiments. Every expert group describes its experiment. In the lab the groups examine each other's designs and perform all the experiments.

A class discussion is held in the circle about the newly acquired knowledge to a public consisting of parents and other students from the school.

Conclusion phase: closing activities

In the final stage of the project, students mainly read each other's texts and give advice. New texts are only read when supplementary information is needed. Once all questions are answered, students concentrate on the products needed for the presentation of their space lab to the public. Products include instructional texts (posters) accompanying the experiments installed in the space lab, and an animated movie showing the functioning of all experiments in the lab. Finally, there is a full class discussion centered on reflection and metacognition.

References

Allington, R. L. (2002). What I've learned about effective reading instruction from a decade of studying exemplary primary classroom teachers. *Phi Delta Kappan, 83*(10), 740–747.

ATLAS.ti (Version 6.2) [software] (2010). Berlin, Germany: ATLAS.ti Scientific Software Development GmbH.

Bogaert, N., Devlieghere, J., Hacquebord, H., Rijkers, J., Timmermans, S., & Verhallen, M. (2008). *Aan het werk! Adviezen ter verbetering van functionele leesvaardigheid in het onderwijs* [Advice for improvement of functional literacy in education by the Dutch Workgroup Functional Reading]. The Hague.

Dyson, A. H. (2000). Linking writing and community development through the children's forum. In C. D. Lee & P. Smagorinsky (Eds.), *Vygotskian perspectives on literacy research* (pp. 127–149). Cambridge: Cambridge University Press.

Fleischman, H. L., Hopstock, P. J., Pelczar, M. P., & Shelley, B. E. (2010). *Highlights from PISA 2009: Performance of U.S. 15-year-old students in reading, mathematics, and science literacy in an international context (NCES 2011-004)*. Washington, DC: U.S. Government Printing Office.

Guthrie, J. T., & Klauda, S. L. (2014). Effects of classroom practices on reading comprehension, engagement, and motivations for adolescents. *Reading Research Quarterly, 49*(4), 387–416.

Guthrie, J. T., McRae, A., & Klauda, S. L. (2007). Contributions of concept-oriented reading instruction to knowledge about interventions for motivations in reading. *Educational Psychologist, 42*(4), 237–250.

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Reading research handbook* (Vol. III, pp. 403–424). Mahwah, NJ: Lawrence Erlbaum Associates.

Guthrie, J. T., Wigfield, A., & You, W. (2012). Instructional contexts for engagement and achievement in reading. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 601–634). New York: Springer.

Hacquebord, H., Linthorst, R., Stellingwerf, B., & De Zeeuw, M. (2004). *Voortgezet taalvaardig. Een onderzoek naar tekstbegrip en woordkennis en naar de taalproblemen en taalbehoeften van brugklasleerlingen in het voortgezet onderwijs in het schooljaar 2002–2003.* [Advanced language proficient. A study into text comprehension and vocabulary and language problems and needs of students in the first year of secondary education in 2002–3003]. Groningen: Expertisecentrum taal, onderwijs en communicatie.

Hedegaard, M. (1999). Activity theory and history teaching. In Y. Engeström, R. Miettinen, & R. L. Punamäki (Eds.), *Perspectives on activity theory* (pp. 282–297). Cambridge: Cambridge University Press.

Mahn, H., & John-Steiner, V. (2002). The gift of confidence: A Vygotskian view of emotions. In G. Wells & G. Claxton (Eds.), *Learning for life in the 21st century. Sociocultural perspectives on the future of education* (pp. 46–58). Oxford: Blackwell.

McKeown, M. G., Beck, I. L., & Blake, R. G. K. (2009). Rethinking reading comprehension instruction: A comparison of instruction for strategies and content approaches. *Reading Research Quarterly, 44*(3), 218–253.

Mercer, N., & Littleton, K. (2007). *Dialogue and the development of children's thinking*. London: Routledge.

Miller, S. M. (2003). How literature discussion shapes thinking: ZPDs for teaching/learning habits of the heart and mind. In A. Kozulin, B. Gindis, V. S. Ageyev, & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 289–316). Cambridge: Cambridge University Press.

Pels, T., & Nijsten, C. (2006). Eenheid en diversiteit in de opvoeding. In T. Pels & W. Vollebergh (Eds.), *Diversiteit in opvoeding en ontwikkeling. Een overzicht van recent onderzoek in Nederland* (pp. 47–76) [Unity and diversity in education. A review of recent research in the Netherlands]. Amsterdam: Aksant.

Pompert, B. (2004). *Thema's en taal [Themes and language]*. Assen: Van Gorcum.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54–67.

Smagorinsky, P. (2001). What is meaning made from? *Review of Educational Research, 71*(1), 133–169.

Smagorinsky, P. (2011). *Vygotsky and literacy research. A methodological framework*. Rotterdam: Sense Publishers.

Snow, C. (2002). *Reading for understanding. Toward a research and development program in reading comprehension*. Santa Monica, CA: RAND.

Tesser, P. T. M., & Iedema, J. (2001). *Rapportage minderheden 2001. Deel I Vorderingen op school* [Minority report 2001. Part I Progress at school]. The Hague, the Netherlands: Sociaal en Cultureel Planbureau (scp-publicatie 2001/17a).

Van den Broek, P., Kendeou, P., Kremer, K., Lynch, J. S., Butler, J., White, M. J., et al. (2005). Assessment of comprehension abilities in young children. In S. Stahl & S. Paris (Eds.), *Children's reading comprehension and assessment* (pp. 107–130). Mahwah, NJ: Erlbaum.

Van Oers, B. (2009). Developmental education: Improving participation in cultural practices. In M. Fleer, M. Hedegaard, & J. Tudge (Eds.), *Childhood studies and the impact of globalization: Policies and practices at global and local levels* (pp. 213–229). New York: Routledge.

Van Oers, B., & Wardekker, W. (1999). On becoming an authentic learner: Semiotic activity in the early grades. *Journal of Curriculum Studies, 31*(2), 229–249.

Vygotsky, L. S. (1994). The problem of the environment. In R. van der Veer & J. Valsiner (Eds.), The Vygotsky reader (pp.338–354). Oxford: Blackwell.

Wardekker, W. (2012). Responsible teaching. In B. Van Oers (Ed.), *Developmental education for young children* (pp. 27–40). Dordrecht: Springer.

Wells, G. (2000). Dialogic inquiry in education. In C. D. Lee & P. Smagorinsky (Eds.), *Vygotskian perspectives on literacy research*. Cambridge: Cambridge University Press.

Wells, G. (2002). Inquiry as an orientation for learning, teaching and teacher education. In G. Wells & G. Claxton (Eds.), *Learning for life in the 21st century. Sociocultural perspectives on the future of education* (pp. 197–210). Oxford: Blackwell.

Wells, G., & Claxton, G. (Eds.). (2002). *Learning for life in the 21st century. Sociocultural perspectives on the future of education*. Oxford: Blackwell.

Wells, G., & Mejía-Arauz, R. (2006). Dialogue in the classroom. *The Journal of the Learning Sciences, 15*(3), 379–428.

Yin, R. K. (2002). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.