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# **The role of textbooks in lower secondary schools in the Czech Republic**

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### **Abstract**

The paper presents research on textbook use conducted in lower secondary schools in Ostrava, in the Czech Republic. The main research aim was to identify the role the textbooks play in teaching and learning in lower secondary schools. The factors influencing the role of textbooks were also examined. The concept of the role of the textbook is discussed from several perspectives in this paper.

The role of textbooks was empirically investigated from four viewpoints: prevalence of textbook use, textbook-based activities, the role of textbooks in students' homework, and textbook control. The investigation was conducted in ten lower secondary schools. A total of 155 lessons across 20 classes were observed to elicit data on the prevalence of textbook use in various phases of the lessons, and the time and frequency of textbook-based activities. The observations were conducted during English, History, Mathematics and Civics lessons and supplemented with individual semi-structured interviews with teachers and pair interviews with students.

The research findings confirmed that textbooks were used extensively, particularly in the presentation of new content. Textbooks were mainly used for activities based on text perception. Simple activities prevailed, such as reading the text aloud, or students following the text with the teacher's explanation. As to the students' use of text materials, the research concluded that students largely ignored the textbooks for their homework; they did not "learn from textbooks". The teachers used the textbooks for various purposes: primarily as a resource for content and for assigning tasks and

exercises. The research suggests that textbooks impact greatly on lesson content and to a certain degree on the methodology of the lesson.

**Key words:** Textbook use, Role of textbooks, Textbook-based activities, Textbook control

## Introduction

This paper will present the findings of a research project on textbook use conducted over three years in the eighth grades of ten lower secondary schools in Ostrava, a city in the Czech Republic. The project sought to answer the key question: What is the role of textbooks in teaching and learning in lower secondary schools?

Textbook usage in primary and lower secondary schools still requires approval by a central authority, namely the Ministry of Education. Non-approved materials can be used, but are not subsidized by the state. However, schools can choose from quite a large selection of prior-approved textbooks, usually between six and ten on each subject by various publishers. Upper secondary students are expected to purchase textbooks themselves, which causes some problems, especially in vocational schools. As a rule, primary and lower secondary school teachers may decide as a committee on their choice of textbooks. The head teacher of the subject department may hold the final vote. Students are provided with textbooks for all subjects, with the exception of arts and physical education. Textbooks are provided free of charge to first grade pupils. From second to ninth grade, textbooks are supplied on loan for the year. Students may take their textbooks home. Depending on the financial situation of the school, every five or six years textbooks are changed and students provided with newly selected titles. The Czech educational system is traditionally tied to textbook use. Even though usage is not obligatory, teachers and students are expected to work with textbooks extensively.

The curriculum reform that has recently been carried out in Czech primary and secondary schools has yielded two notable changes with implications for textbook use: an educational model primarily aimed at acquiring generic competences, and decentralization in curriculum decision-making. The reform based educational programs have been developed centrally; teachers in schools need to transform them into school educational programs according to the local conditions.

## Background

The concept of “the role of the textbook” refers to the expected ways in which the textbook functions in the teaching and learning process. It also refers to the typical features the textbook is assumed to have. However, these typical features of textbooks can manifest themselves in unique ways. Within a particular conception of teaching and learning the role of the textbook is relatively stable; when the conceptions of the teaching role changes, then of the role of the textbook changes accordingly. In other words, teacher practice and textbook use are intricately entwined.

When researchers examine various roles that the textbook can play in a teaching process, i.e. the various ways in which the textbook functions in this process, they can have in mind different aspects of the role and can examine the role from different perspectives:

- Time measurement of the prevalence of textbook use is one of the most frequent methods of examining the role of textbooks.
- A large number of investigations into textbook use focus on the purposes of textbook use.
- A considerable number of studies focus on the extent to which a teacher follows or does not follow the textbook, i.e. to what extent the planning and realisation of teaching is textbook-bound.
- The role of the textbook has also been examined from the viewpoint of textbook influence.

## Prevalence of textbook use

Time data form the basis of research on textbooks use; even though this cannot be relied on to explain textbook roles entirely. Research shows that approximately 80–90 percent of all teachers working in primary and secondary schools use textbooks (DeCesare 2007; Reints & Lagerweij 1989 in Johnsen 1993, Sikorová 2004, Zahorik, 1991 et al.). It has been demonstrated that the frequency of textbook usage, i.e. the percentage of lessons which employ textbooks, is also significantly high. Research shows that in mathematics the frequency of textbook usage is as high as 90 percent (Hiebert et al. 1999) and in science it amounts to 67 percent (Roth et al. 2006). According to Sikorová and Červenková (2007), the average frequency in primary and secondary schools is 75 percent. The total time of textbook usage, i.e. the percentage of teaching time spent with activities based on textbooks, depends on the particular subject. Laws and Horsley (1992) have found that at secondary schools it ranges from 20 to 50 percent in subjects associated with social sciences; in mathematics it amounts to up to 80 percent of teaching time. Figures from research by Sigurgeirsson (1992) are similarly high; the percentage of teaching time spent with textbook-based activities ranges from 46 percent in geography to 97 percent in English; a certain exception was represented by music lessons, which employed textbooks for only 16 percent of the teaching time.

## Purposes of use

In the 1980s two important studies were carried out in the United States. Hinchman (1987) investigated how teachers use textbooks in the classroom. She worked with three secondary school teachers who taught various subjects from grades. Drawing on field notes and audiotaped interviews, Hinchman identified three different types of textbook use. The first involved *methodical coverage* of the curriculum, based on the textbook; the second used primary and supplementary texts as the *basis for text-based activities*; the third type used selected texts *as a reference for higher level interpretation* during class discussions. Alvermann's study (1987) concerned textbook use within post-reading discussions of regularly assigned content. The research was based on videotaped lessons and interviews, which studied 24 lower secondary school teachers in various subjects. The textbook use which prevailed amongst teachers was *to refocus discussions which had started to digress*, and thus to settle

the class down. Literature teachers mostly used textbooks to *refer indirectly to the previously read text*. This pattern was also used by teachers of other subjects. In classes of gifted students and in classes of students with multiple disabilities, textbooks were mainly used *to clarify points of disagreement in discussions*. The fourth pattern occurred almost exclusively in the classes of science teachers, who used textbooks *to prompt answers not immediately forthcoming*.

A phenomenographic approach was applied by British researchers Peacock and Gates (2000), who investigated textbook use with 23 newly qualified primary teachers. The research revealed that the textbooks were not used in the many different ways their authors intended. There was a high degree of consensus in the perception of the role of science textbooks among teachers: the text was peripheral to the direct learning of science ideas. Despite differences in teacher training, teachers frequently identified four uses of science texts: for the *preparation of science lessons*, as a *starting point for new topics*, to *guide students through practical activities*, and also when a *particular practical activity was regarded as inappropriate*.

Lambert's research (1999) was carried out in geography lessons at seven secondary schools in London and its surrounds. In each school 112 lessons were observed, focusing on two 8<sup>th</sup> grade classes. The observations were supplemented with teacher and student interviews. The observers identified three distinct roles ascribed to geography textbooks. Firstly, the textbook was used as a *tool of classroom control*, to help settle the class down. The second role was identified as *curriculum mediator*. This means that a textbook is used as a tool for structuring the teaching content and as a source for methodological processing of the lesson. The third role of the textbook identified in Lambert's research was the use of the textbook as *curriculum support*. The textbook served as a source of information (or perhaps as one of the sources); a means of motivation; a source of support for the special needs of pupils; a source of materials for additional work; a source of examples, case studies and pictures; and a basis for self-study (e.g. during the student's absences from school).

Teachers' opinions on textbook use were investigated by Australian researchers Tulip and Cook (1993) at schools in Queensland. Drawing on academic literature, four main areas of textbook use were determined and within these, ten purposes that textbooks could fulfill. The research was carried out in secondary schools, with 390 teachers and 444 pupils participating. Tulip and Cook designed questionnaires for teachers and pupils and tried to elicit whether both groups of respondents saw the use of science textbooks similarly or differently. Teachers and students significantly differed in their views on the extent of textbook use; for eight out of ten items, students considered the frequency of textbook use for a given purpose to be higher than teachers claimed. The data imply that students see textbooks as a crucial part of science teaching, while teachers tend to downplay their use in a classroom. Teachers and pupils agreed on the most frequent purposes for textbook use: *to set students' homework* and *for student activities*. The answers concerning the questionnaire item "teaching/studying guidance" demonstrated that teachers rely on textbooks heavily when they decide what to teach and when to teach it, *to determine the sequence of topics* and *to determine the depth of the topic*.

Despite the fact that the aforementioned research focused on different subjects and different grades, it is possible to summarise the results to a certain extent. Some

purposes were repeatedly identified in different teaching environments. Firstly, textbooks are used as a source of the content and as a program for teaching. Teachers search textbooks for information about subject matter: especially how it is structured, if it is presented in detail or not and what the sequence of topics is. Moreover, at least some teachers rely on textbooks when preparing and realising lessons; they follow the methodology explicitly or implicitly contained in textbooks. Another frequently identified purpose is as a source for student activities. Teachers see textbooks as a source of texts and learning tasks, which could be used as a basis for student activities in the classroom or at home: textbooks can serve as a guide to practical activities. Besides these three main purposes, textbooks are used in discussions (as a source of suggestions or a way of verifying the point of disagreement); as a means of stimulating students and a means of classroom control and organisation (to settle the class down, to refocus discussion, to engage students in a learning process); and as a means of self-study.

## **Teacher dependence on textbooks**

Teachers can rely heavily on textbooks when planning their teaching, or they can refuse to work with textbooks altogether. A number of studies carried out in various countries have shown that textbooks are used on a large scale. But what is the relationship between a textbook and an actual teaching and learning process? Do teachers follow the textbooks? Do they plan their lessons in accordance with pedagogical procedures suggested in the textbook or do they depart from them? Do they use the articulations included in the textbook? Do they present the subject matter to students in the form of representations from the textbook or do they use their own representations? In general, to what extent does the outcome of psychodidactic transformation carried out by textbook authors (potential teaching content) correspond with the outcome of psychodidactic transformation carried out by a teacher (actual teaching content)?

At the University of Michigan, Freeman et al. (1983) conducted 12-month case studies of seven elementary school mathematics teachers and interviews with another 20 teachers. Freeman identified three distinct styles of textbook use in mathematics. The first of these, *textbook-bound style*, is characterised by a teacher proceeding page by page through the book; the textbook is both a source of information and methodology. The second style is related to the previous but is characterised by *selective omission*. The teacher proceeds page by page through the book but skips some chapters in their entirety. In the third style, the teacher focuses on the *basics*. Teachers who used this style considered seven thematic units as basic topics for the 4<sup>th</sup> grade and acted accordingly.

Extensive qualitative research at 700 schools was conducted by Dutch experts Reints and Lagerweij (1989, in Johnsen 1993). This research is especially interesting since the methods used quantified the proportions of teachers employing different styles of textbook use. The investigations were carried out at primary and lower secondary schools in various subjects including geography, social sciences, and mathematics. The types of textbook use were divided into four categories:

1. 11% of teachers followed the textbook page by page;

2. Textbooks dictated the structure of the teaching but the teachers supplemented the books with their own materials (about 50% of teachers);
3. For 10% of teachers, textbooks were just one of several equally important sources; many combinations of styles 2 and 3 were practised by approximately twenty percent of the teachers;
4. 10% of teachers did not use textbooks at all.

Further research dealing with the extent to which teachers follow or do not follow textbooks was carried out by a Canadian-American team led by Nicol and Crespo (2006). The researchers investigated how four student teachers used textbooks during their university coursework and practical teaching, and how they explained such use. These were prospective teachers of mathematics and the data were gathered through observations and interviews with students. The study revealed that for each prospective teacher the mathematics textbook became a curriculum guide. The textbooks played a significant role in helping the students decide what and how to teach. To a certain extent each of the students followed or covered the material in the texts, although they did so in qualitatively different ways. Three approaches to textbook use were identified: *adhering*, *elaborating* and *creating*. The first student adhered to the textbook and teacher's guide. They accepted the text as the authority for what and how to teach and made few or no adaptations to text, tasks, problems and exercises in the text. Two students elaborated on the textbook lessons and suggested activities. They considered the text a main resource but supplemented it with other resources and made both conceptual and contextual elaborations. The last student used the text to create their own units of study. This student considered the text as one of many resources and examined it for its potential and limitations in deciding what and how to teach. The student created problem tasks and questions using the text in order to stimulate ideas for the structure and sequence of lessons.

## Textbook control

Teachers use textbooks widely; teachers and parents obviously respect them. What is the real influence of textbooks? Scholars, when pondering the role of textbooks in teaching, use terms such as *textbook control* (Johnsen 1993, Apple 1992), *textbook impact* (Sigurgeirson 1992, Luben & Campbell 1993), *textbook influence* (Ball & Cohen 1996) and *textbook-driven instruction* (Stodolsky 1989). Do teachers really follow textbooks? Do they accept the concepts, content and methodical strategies imposed upon them by particular textbooks?

Certain researchers measure the influence of textbooks by the extent to which they are used in teaching and planning the lessons. The extent of textbook usage is but one factor which allows us to measure how textbooks control teaching; however, this factor is essential. Research focused solely on textbook control deals with ways textbooks control teaching; mostly it seeks to quantify the correspondence between the content and methodology imposed by a particular textbook, and the content and teaching strategies employed by a teacher. Most studies dealing with textbook control demonstrate that textbooks influence both the content of lessons and teaching strategies employed.

DeCesare (2007) has studied sociology teaching at secondary schools in the U.S.A. with regard to textbooks. DeCesare sent detailed questionnaires of 75 questions to a

randomly chosen sample of 1,000 high schools; 60.3 percent of respondents returned the questionnaires. DeCesare found that high school sociology teachers employ textbooks frequently (89 percent) and that the teachers rely overwhelmingly on standard introductory textbooks to structure their courses. The outcome of this approach is homogeneity of lesson content. Generally, the teaching of this particular subject was significantly uniform. However, widespread reliance on textbooks should not be understood as a sign of teachers' approval of them – some teachers harshly criticised the textbooks.

Research conducted within the Chicago Algebra Project (Fan & Kaeley 1998) concentrated directly on the influence of textbooks on the teaching strategies of high school mathematics teachers. Researchers compared the teaching methods of 13 teachers employing a “reform”; textbook with the teaching strategies of 13 teachers working with a rather traditional, widely recommended textbook. The teaching strategies of both groups of teachers varied significantly depending on the strategies of the textbook used. Teachers working with a reform textbook preferred small groups of students and paid more attention to the work with expository texts. Explanation was used less, as was individual student work. Differences in teaching were closely related to the different conceptions of both textbooks. Fan and Kaeley concluded that textbooks influence not only the content of teaching but also the teaching strategies.

One of the most prominent contributions on textbook usage is an extensive study by the Icelandic scholar Sigurgeirsson (1992). This research explored the influence of textbooks on teaching in order to measure the extent of teachers' dependence on textbooks. The research was carried out through observations in classrooms and by formal and informal interviews with teachers and school principals. All subjects for 20 classes in 12 lower secondary schools were studied. Sigurgeirsson summarised the most important conclusion of his research as follows: “Although teachers differed considerably in the extent to which they relied on published curriculum materials, such materials provided the basis for learning in the majority of lessons observed, both in what was being taught and how.” (Sigurgeirsson 1992, p.11). Textbooks to a great extent influenced the teaching. Typical teaching patterns followed the structures of textbooks. Teaching was textbook-oriented; the main task seemed to be covering pages in textbooks by reading them aloud, discussing their content or completing most of the activities presented – “a finished page is the proof that work has been done” (Sigurgeirsson 1992, p.163).

Similar results confirming the influence of textbooks on teaching prevail in studies dealing with textbooks. However, there have been studies that have presented essentially different results or that have challenged the validity of statements suggesting the dominant influence of textbooks on teaching. For example, Freeman and Porter (1988) concluded that the extent of a teacher's dependence on textbook topics does not necessarily represent the measure of their textbook dependence, but rather presents the measure to which particular teachers are convinced that textbooks can be considered a “legitimate authority” concerning the content. Moreover, the measure of textbook dependence can also suggest that a particular teacher considers certain topics appropriate (or not) for their students.

Similar results were arrived at by Stodolsky (1992). Based on empirical research as well as analysis of other studies, Stodolsky concludes that teachers to a great extent re-make textbooks and that the influence of textbooks is definitely not as overwhelming and unambiguous as various studies suggest. Stodolsky emphasizes that "... the phrase *teaching by the book* conjures up an image of close adherence to textbook content, order, and suggested activities, and implies that the textbook is the central, if not the only, material used during the instruction" (Stodolsky 1992, p. 159). However, "teaching by the book" is actually open to many interpretations.

Stodolsky carried out textbook usage research in the 5<sup>th</sup> grade of primary school; 12 experienced teachers – six math and six social studies – were observed for 14 teaching days. The mathematics teachers differed significantly from each other regarding textbook usage. Stodolsky considered their methods to be autonomous. The most significant differences were found between activities suggested by a textbook and activities realized in teaching. The situation in social studies was different. Teachers employed more complementary materials than in mathematics. Topics suggested by a textbook were covered in class and usually in the suggested order. Unlike the mathematics teachers, the social studies teachers broadened the scope of topics with ones not suggested by the textbook. Stodolsky concludes that differences in textbook usage are related to a teacher's own beliefs and preferences, the nature of the materials, the school context, the particular students in the class, and the subject matter and grade level. The central determinant of the role of textbooks in instruction is, according to Stodolsky, the subject matter.

Further research confirming Stodolsky's findings was undertaken by Sosniak and Stodolsky in 1993. Working with teachers of mathematics, social studies and reading, researchers worked with four teachers at two schools for a year. Individual teachers differed regarding textbook usage. When designing classes the teachers selected, modified and complemented the topics covered by the textbook. They paid attention to the topics suggested by a textbook; however, most of them ignored the pedagogical strategies suggested.

Even though Stodolsky theoretically analyses and empirically proves that textbooks are not as dominant in teaching as the majority of other researchers suggest, her conclusions confirm at least a certain degree of textbook influence on teaching – specifically on the topics presented. Stodolsky's research demonstrates the importance of a particular research approach and the way the research findings are interpreted.

## **Research aims and methodology**

This research project sought to answer the key question: What is the role of textbooks in teaching and learning in lower secondary schools? A subsequent question was aimed at the factors which may influence this role: Do the roles of the textbook vary depending on the school subject, the teacher's practice and the teacher's qualifications for teaching the particular subject? This investigation was focused on textbook use in English, history, mathematics and civics lessons.

The notion of the textbook, for this project, is the traditional "basic textbook"; that is, a published pedagogical text intended for primary or secondary education that has the

following specific qualities: it is adapted to the student's age, and contains expository components, non-verbal components, e.g. drawings, photos, figures, schemes, and components which ensure the control of learning, e.g. tasks and questions. Apart from the "basic" textbook, other text resources used for teaching and learning purposes will be referred to as "other text materials".

The role of textbooks was studied from four aspects, each comprising partial research questions:

- A. Prevalence of textbook use in lessons:
  - What is the frequency and time of textbook use?
  - What is the frequency of textbook use in lesson phases?
  - What is the frequency of use for the main components of the textbook (expository texts, tasks, pictures)?
  
- B. Textbook-based activities:
  - What textbook-based activities do teachers and students perform in lessons?
  - What is the cognitive complexity of textbook-based activities?
  
- C. The role of textbooks in students' homework:
  - How often do students use textbooks and other text materials in their homework?
  - What learning strategies do students apply while learning from text?
  - Do these strategies vary between successful and unsuccessful students?
  - What are students' opinions of the role of textbooks?
  
- D. Textbook control:
  - To what extent do the teachers follow the textbook in planning the lessons?
  - For what purposes do the teachers use the textbooks?
  - Do the textbooks control the content and methodology of lessons?
  - What principal styles of textbook use do the teachers employ?

The pilot study was conducted prior to the research to suggest the categories of textbook-based activities, kinds of text materials and purposes of use. The pilot study aimed at proving the tools for observation and the interviews.

The structured observations of lessons were conducted in ten lower secondary schools in Ostrava selected on the base of random sampling. Two 8<sup>th</sup> grade classes were observed in each of the schools; the intention was to observe two lessons in each subject. In all, 155 lessons were recorded by six observers; with respect to the research questions, the frequency and the duration of textbook-based activities, the lesson phases, the teaching methods and forms. The coding was accomplished as soon as possible after the observation; disputable points were discussed during regular meetings.

The data on the lessons observed according to the subject are presented in Table 1.

Number of lessons	Subject				
	English	History	Math	Civics	Total
N	40	40	37	38	155
%	25.8	25.8	23.9	24.5	100

**Table 1: Observed lessons according to subject**

In one fourth of observed lessons teachers were not fully qualified for teaching the subject. This is the case for English lessons in the Czech Republic because of the on-going shortage of qualified English teachers in lower secondary schools. However, there is a similar shortage for civics, which is considered less important than other subjects: every teacher is supposed to be able to teach it.

The observations were immediately followed up with semi-structured interviews with the teachers involved. Fifty-two teachers were interviewed. The interviews focused on seven areas: text materials used in lessons, the evaluation of the textbook used, the extent of the teacher's dependence or independence on textbooks, the purposes of textbook use, the use of the teachers' book, the role of textbooks in developing the school curriculum and students' homework using textbooks.

Three months later the semi-structured paired interviews were carried out with students from the classes observed. The subject teachers had chosen three pairs from each class: always the (boy and girl) pair with excellent learning achievement, the pair with average achievement and the pair with below-average achievement. The interviews were aimed at the students' strategies in learning from text; their use of textbooks and other text materials in homework; and their opinions of the role of textbooks.

## Research results: prevalence of textbook use

Time measurement is one of the most frequent methods of examining the role of textbooks. It was important to find out how often and how long the teachers and students worked with textbooks, in what lesson phases the textbooks were indispensable, and which textbook components – e.g. expository texts, tasks, pictures – were employed and which were omitted.

The study found that textbooks were widely used in teaching and learning in lower secondary schools in the observed subjects. Textbooks were used in 76 percent of the lessons observed. The students and teachers spent a third of the total time of all the lessons with textbooks. However, these figures relate only to "basic" textbooks (as noted earlier). As far as all text materials are concerned, these were used in all lessons observed but one, and the time spent with some kind of text accounted for 70 percent of the total time. The various kinds of texts covered published materials comprising school pedagogical texts such as workbooks, worksheets, readers, reference books, anthologies, atlases and textbooks, and other published texts such as newspapers, journals and websites. Unpublished text materials used in lessons included texts written by teachers and students, such as notes written on the blackboard, presentations, students' essays and tests made by teachers. Synoptic data concerning the time and frequency of usage of all text materials types are presented in Table 2.

Types of texts	Time of use		Frequency of use	
	N (min)	%	N (lessons)	%
All types of written texts	4688.5	69.3	154	99.4
School pedagogical texts, incl. textbooks	3010	44.5	134	86.6

Textbooks	2120.5	31.4	119	76.8
Other published texts	471.5	7	41	26.5
Unpublished texts	1207	17.9	96	61.9
Total length of all lessons	(of 6761.5)			
Total number of lessons			(of 155)	

**Table 2: Frequency and time of use of all text materials**

Textbooks were used more frequently and for longer time periods in history classes than in other subjects. The extent of use of other text materials varied according to subject – workbooks prevailed in English; sets of exercises in mathematics; and the Internet, newspapers and journals in civics. The degree of use of textbooks did not vary depending on the teacher's practice; novice teachers used them for approximately the same time and at the same frequency as more experienced teachers.

Monitoring textbook use in particular lesson phases was significant, because it helped determine the purposes of textbook use. As can be seen from Table 3, textbooks were used most in the phase of new content presentation and the phase of practicing new content. Students and teachers spent about 40 percent of these two phases with textbook-based activities. The proportion of textbook use was quite high in the application phase as well, and in the phase of reviewing the procedures students had learned in the lesson.

Lesson phase		Total time	Time spent with textbook	
		min	min	% from phase length
FA1	Revision	517.5	93	18
FA2	Introduction to lesson	123.5	7.5	6.1
FA3	New content presentation	1921	845.5	44
FA4	Practising/fixing of new content	1782	705	39,6
FA5	Application/deepening of content	584.5	172.5	29.5
FA6	Summary of content	85	14	16.5
FA7	Review of procedures	50	19	38
FA8	Examining, testing, homework checking	894	211.5	23.7
FA9	Other	805	52.5	6.5
Total		6762.5	2120.5	31.4

**Table 3 : Time spent with textbook according to lesson phase**

When using the textbook, students worked mostly with expository texts and learning tasks. The usage of non-verbal components – such as pictures, drawings, schemes and graphs – occurred only rarely, mostly in history. Other structural components of the textbook were used only marginally.

The findings concerning textbook prevalence correspond to the results of many other studies. All fifty-two teachers involved in the study used textbooks. The extremely high percentage of teachers using textbook confirmed the data gained from the previous study of Sikorova (2004): only three from the total amount of 783 primary, lower and higher secondary school teachers did not use textbooks. The percentage of teachers using textbooks ranges from 82 to 95 percent (DeCesare 2007, Reints & Lagerweij 1989, Zahorik 1991 etc.). Sigurgeirsson (1992) reported on 62 percent of

average time of textbook use but the data from other investigation are somewhat lower (Freeman & Porter, 1988; Laws & Horsley, 1992) and differ according to the subject considerably.

## **Textbook-based activities**

It is not sufficient to explore how often and how long students and teachers use textbooks; it is necessary to reveal what they do with them. As a result of the observations, 29 different textbook-based activities were identified. In all four subjects two activities prevailed as to time and frequency of use: “the teacher explained the subject matter; the students followed the text at the same time” and “the students read the expository, explanatory or supplementary text aloud one after another; the teacher called them up”. If the textbook was employed in the lesson, in about half of those lessons the students read the text aloud (in 45 percent of the lessons observed) or followed the text while the teacher explained the subject matter (in 43 percent of the lessons). The frequency data are not as disturbing as the data on the time: for about a quarter of the total time spent with textbooks the students were engaged in these two simple activities. As will be seen, more complex and sophisticated activities did not occur frequently.

Of the ten most frequent activities, only two stood out as more demanding from the viewpoint of cognitive processes required: “the students looked up the data, information or examples in the text” and “the students and the teacher discussed the topic they had just read”. Both frequency and time of the particular activities varied according to the subject, and did not vary according to the teacher’s practice and qualifications.

Exploring the issue of textbook-based activities was designed not only to find out what activities occur in the lessons but also to elicit what cognitive operations students are bound to perform when working with textbooks and how demanding the activities are from this point of view. Since a taxonomy for textbook-based activities could not be found in current textbook theory, it was necessary to create one. The problem lies in the fact that there are taxonomies based on the theory of learning from the text (e.g. Sarig 1996, or PISA Assessment Framework 2009), but they focus on understanding the text and on direct work with it, not on the wider framework of textbook-based activities. On the other hand, commonly used learning tasks taxonomies, such as the taxonomy by Tollingerová (1983), developed from Bloom’s taxonomy of teaching and learning objectives, were too general for this purpose, since they had not been designed for textbooks. For this reason, the taxonomy used in this project was developed for classification of textbook-based activities according to cognitive complexity, and based partially on the taxonomy of Gavora (2008) and on the analysis of the pilot study results. The taxonomy comprises activities related to learning from text, to learning tasks and activities linked to pictorial material in textbooks.

Five categories of activities were suggested:

1. Perception: information-receptive activities; the perception of the text predominates
2. Application: application of knowledge; solving of algorithmic tasks

3. Looking up: activities based on the orientation in the text, on finding out explicit information
4. Interpretation: activities based on analysis and interpretation of text
5. Problem solving: solving of problem tasks with a heuristic base.

The frequency and time of the five types of activities according to the cognitive demands were explored. The findings are summarized in Table 4.

Activity type	Frequency of use		Time of use	
	N (lessons)	%	n (min)	%
Perception	102	86.4	818.5	38.6
Looking-up	42	35.6	272.5	12.9
Application	57	48.3	595	28.1
Interpretation	21	17.8	264	12.4
Problem solving	11	9.3	170.5	8
	(of 118)		2120.5	100

**Table 4: Frequency and time of use of activities**

Textbooks were mainly used for activities based on text perception, such as reading aloud, mute reading, copying text, looking through pictures, and listening to text. Text perception activities occurred in 86 percent of lessons and students pursued them for almost 40 percent of the time spent with textbooks. Problem-based activities with textbooks were assigned rarely – only in 10 percent of lessons; they account for 8 percent of the total time with textbooks. The frequency of the types of textbook-based activities varied depending on the subject. In mathematics lessons, students applied the subject matter to algorithmic exercises during practice more often than in the other three subjects: in history lessons they searched in texts more frequently than in mathematics. An interesting finding was that the least experienced teachers with the shortest practice assigned text perception activities less than other groups of teachers.

The research on textbook-based activities in the classroom is rather rare. Therefore it was difficult to compare the data with other research findings. In the Czech Republic Janík (Janík et al. 2007) analyzed sixty-two video-recordings of physics lessons in lower secondary schools and apart from other things they examined the use of textbooks. The study reported on typical textbook-based activities in physics lessons: a) the students solved tasks in textbooks individually, b) the students solved tasks with the teacher, c) the student or the teacher read the text, d) the teacher dictated the text based on the textbook, e) the student or the teacher described the picture in the textbook, f) the student copied the text or drawing. It is impossible to determine the type of tasks in the “a” and “b” cases but the activities from “c” to “f” are of perceptive nature.

The conclusions may lead to considering the idea that the use of textbooks focuses on text perception activities in the classroom. Therefore Zahorik’s study of teaching styles should be recalled. Zahorik (1991) identified three basic teaching styles: the coverage style operating at the knowledge level focusing mainly on memorizing the information; the extension style including activities requiring comprehension and application and the thinking style engaging students in activities based on critical and

creative thinking. Zahorik tested the relationship between the teaching style and the use of textbook and concluded that the relation did not exist.

## **The role of textbooks in homework**

Unlike lessons at school, students largely ignored textbooks in their homework: they did not learn from textbooks. Most of the students reported that they did not regularly prepare for lessons; more than two thirds confessed they did not prepare at all, in spite of teachers expecting them to do so. If they studied at home, notes in the exercise books dictated by teachers served as learning resources more often than textbooks. This phenomenon did not relate to gender. In fact, the interviews showed that students with excellent learning achievement most often studied from exercise books, while students with below-average achievement preferred textbooks. It was assumed that studying from the textbook at home would be undertaken mainly for history and civics lessons, but this proved not to be the case. Seventy percent of students reported they did not study from history textbooks at all and 79 percent had never studied from the civics textbook. No students admitted using the textbook regularly.

The students' strategies used in learning from text were based on the memorization of information. Half the students claimed they employed no typical learning method; 15 percent reported they read the text again and again or copied it several times word by word in order to memorize it. Only a few students underlined sentences, highlighted the most important words in the paragraph, wrote out a summary/extract or used associations. Written homework was assigned more often in Mathematics and English than in History and Civics. In Mathematics the written homework was set once or twice a week in one half of the classes: in English in three quarters of the classes. Revision of subject matter explained in the lesson was the typical Mathematics homework (according to all students interviewed); filling in gaps in the text was most characteristic for English (82 percent of students). Written homework in History was assigned only on rare occasions: in Civics sporadically. Typical assignments in History and Civics were essays or presentations, at the most twice a year.

The majority of students (73 percent) were convinced that textbooks are necessary for one reason or another: looking up information; setting tasks in class and – paradoxically – for learning at home. Twenty two percent believed textbooks were rather useless. The remaining 5 percent of students supposed they were useful only in some subjects. According to the students, textbooks are important for teachers (80 percent of students); as a source of lesson content (33 percent); and as a teaching program (27 percent). Only a few students believed textbooks were intended only for students' learning and the remainder did not know if textbooks were important or not.

## **Textbook control**

The issue of textbook influence on teaching represents the key problem in examining the role of the textbook. Does the textbook impact on the nature of instruction? If so, how strong is its control? Do teachers use textbooks like recipe books; do they follow them page-by-page to the end? Or is it more common that teachers do not take textbooks into consideration? In what ways can textbooks influence teaching? The

empirical investigation of these questions was based on observations and interviews with teachers. The results have been derived from data on: a) the manner by which the teachers followed or did not follow the textbooks while preparing lessons; b) the purposes of textbook use, c) using the textbooks as a basis for thematic plans, i.e. month-by-month teaching plans made by teachers at the beginning of the school year and d) the role of textbooks in school curriculum development.

Textbooks were used for planning the lessons extensively, even though most of the teachers modified them in some way before use. All teachers in the study employed textbooks. One fourth of them reported they use textbooks systematically from the first page to last. For twenty percent of teachers the textbook was only one of the equally valuable learning resources. About 55 percent of teachers modified textbook content to some extent (see Table 5).

Dependence/independence on textbook	Number of dialogues	
	N	%
Systematic coverage (page by page)	15	25,9
Modification of the textbook content	Reduction (34.5%)	32
	Extension (37.9%)	
	Substitution (27.6%)	
More resources	11	19,0
Textbooks not used	0	0
Total	z 58	

**Table 5: Teachers' dependence on textbooks**

English teachers usually followed the textbook systematically, civics teachers modified the content more frequently than others, and math teachers worked more often with several text materials. The results showed no differences amongst groups of teachers according to their teaching experience. It was quite surprising that the degree of textbook usage for planning the lessons did not relate to the teacher's evaluation of the textbook. The teachers used textbooks regardless of their likes or dislikes.

Other investigations, focused on examining teachers' dependence or independence on textbook, have identified similar groups of teachers. Freeman and his colleagues (Freeman et al. 1983) distinguished three main styles of textbook use in mathematics. The first is characterized by a teacher proceeding page by page through the book; the second is characterized by selective omission of some chapters and in the third the teachers focused on the basics. The findings of the Dutch study conducted in 1989 (Reints & Lagerweij 1989) correspond roughly to the categories identified in our investigation.

Teachers used the textbooks for different purposes: first of all as a resource for content (subject matter) and for assigning tasks and exercises (see Table 6). A third of the teachers also used textbooks as a teaching program. From data obtained both from interviews with teachers and observations, textbooks worked as resources for the content of lessons. 85 percent of teachers reported that they used the textbooks not only for the selection of the topic but also as a guide to determine the sequence of topics and the depth of the topic. Textbook usage as a source for learning tasks and exercises has also proven to be substantial. Some teachers employed textbooks

as a starting point for discussions in the classroom and as a means of student motivation. English teachers used the textbooks as a source of content and methodology significantly more often than others. However, it is significant that textbooks served as a source of content for novice teachers less frequently than for their more experienced colleagues.

Purposes (interviews)	Number of interviews	Percent	Purposes (observation)	Number of lessons	Percent
Source of information	49	84.5	Source of information	80	67.2
Source of tasks	30	51.7	Source of tasks	77	64.7
Basis for discussion	22	37.9	Checking and testing	35	29.4
Program of teaching	20	34.5	Basis for discussion	26	21.8
Motivation of students	17	29.3	Program of teaching	10	8.4
Supplementary material	8	13.8	Motivation of students	8	6.7
Inspiration for teacher	8	13.8	Supplementary material	5	4.2
Total number of interviews	(of 58)		Total number of lessons with textbook	(of 119)	

**Table 6: Purposes of use according to the interviews and observations**

The conclusions regarding the purposes of textbook use are in accordance with the results of other studies presented in the introduction of this paper. Even though the studies focused on the different aims, the researchers repeatedly concluded the same. The teachers use the textbooks mainly as the resource of the content, as a program of teaching and the source of learning tasks (Hinchman 1987; Peacock & Gates 2000; Lambert 1999; Tulip & Cook 1993).

The importance of the role of textbooks in planning teaching can be also inferred from their extensive use in the development curriculum documents. During the recent curriculum reform carried out in Czech schools, framework educational programs were to be elaborated into school educational programs by teachers. The teachers in our study were questioned about the process of transforming frame curriculum into school programs and the role of textbooks in this process. When developing the school curriculum, 40 percent of teachers confirmed they proceeded strictly according to the one selected textbook, 26 percent used one textbook as a guide and another 22 percent had no idea how the school curriculum had been developed. That is, more than two thirds of teachers reported that textbooks had served as fundamental sources for intended curriculum materials.

It can be concluded from the findings presented above that textbooks impacted largely on the lesson content and to a certain degree on the methodology of the lesson.

### **Factors influencing the role of textbooks**

Three factors were explored from the viewpoint of their possible influence on the role of textbooks: the school subject, the teacher's experience in teaching and the teacher's qualifications relative to the school subject.

## **Subject**

As previous studies have confirmed (e.g. Laws & Horsley 1992; Hiebert et al. 2003; Roth et al. 2006; Sikorová 2004), the role of the textbook varies according to subject. In this study, History teachers used textbooks in class comparatively more often and for a longer time than English, Mathematics and Civics teachers. Students and teachers worked with different textbook structural components in different subjects: in history, activities with non-verbal material were more frequent than in other subjects. The same stands for exercises and Mathematics. However, expository texts were used to the same degree in all four subjects. As to types of student textbook-based activities, while the same type – i.e. based on text perception – prevailed in all four subjects, other types were applied differently. Students in History lessons searched through texts more often than in Mathematics, and application tasks based on algorithmic rules were used more often in English and Mathematics lessons.

Textbooks, then, were used for different purposes in different subjects: as a basis for discussion more in history and civics than in Mathematics and English, and as a task and exercise resource more in Mathematics and English. In spite of these divergences, teachers across all subjects regarded textbooks as the best source of subject content.

The research identified four basic patterns of textbook use (see Sikorova 2011). These patterns also differed from subject to subject. Almost all the teachers who strictly followed textbooks “page by page” were English teachers. Mathematics teachers fell mostly into the pattern of “source of the tasks”. However, teachers who used the textbook as “one of the resources” and who “modified the content”, taught different subjects.

It can be concluded that the role of textbooks is heavily subject dependent, but there are some common aspects. Despite the differences, in all four subjects the perception of text was the main textbook-based activity; textbooks served teachers mostly as a source of information and there were patterns of textbook use applied to many subjects. It would seem that these aspects are related to the teacher’s conception of teaching and learning.

## **Teaching experience**

Most investigations have recognized the impact of teaching experience on textbook use and its nature. Many researchers have concluded that novice teachers rely on textbooks more than experienced teachers (Elliot & Woodward 1990; Tolman et al. 1998; Laws & Horsley 1992). However, this presumption was not supported by this investigation.

The time taken up by textbook use did not vary significantly with a teacher’s teaching experience. The novice teachers (up to 5 years teaching experience) used textbooks less often than the four groups of more experienced teachers. Similarly, the novice teachers did not follow the textbooks more strictly than other groups. On the contrary, most teachers who strictly followed the textbooks page by page belonged to two of the most experienced teacher groups (21-30 years and more than 30 years of teaching experience). In addition, the most experienced teachers used textbooks

more often as a source of information than novice teachers. No significant differences relating to the patterns of textbook use came to light amongst the groups. The most interesting finding was related to types of textbook-based activities and the demands on students' cognitive processes. In the lessons given by novice teachers, simple activities based on perception were observed less frequently than in lessons taught by more experienced teachers.

These findings must be interpreted carefully because of the limited sampling size. However, although further exploration is essential, the outcomes suggest that experienced teachers relied on textbooks more than novice teachers. There could be an explanation. Since the 19<sup>th</sup> century, Czech schooling has been textbook-centered. The Herbartian tradition is strongly entrenched in central Europe. Teachers have been accustomed to teaching "by the book". This inclination was intensified during the communist era (pre-1989) when teachers were expected to strictly follow the textbook. Textbook content was obligatory in order to prevent teachers from transmitting 'bad', objectionable material. Nowadays the average age of Czech teachers is 47; many started teaching in the 1980s-1970s. The tradition of heavy reliance on textbooks may still persist. However, the younger generation of Czech teachers has been guided, during teacher training, to adopt different learning resources. Even if the textbook is still the main resource and pedagogical tool available, they may not regard it as necessary.

### **Qualifications**

The third factor explored was the teacher's qualification for the school subject. The Czech system of secondary teacher education is usually aimed at earning a qualification for teaching two subjects, e.g. physics and chemistry or Czech and history. However, in their teaching practice, teachers may teach subjects outside their area of specialization. It was assumed, therefore, that unqualified teachers might have different needs related to subject and pedagogical content knowledge in the subject area. In this study, 38 percent of observed English lessons and 45 percent of Civics lessons were taught by teachers unqualified in the subjects. It was expected they may use textbooks more often and rely on them as a source for program and content more than qualified teachers. However, this presumption proved to be completely wrong.

### **Conclusions on the role of the textbook**

The textbook is traditionally defined by three general functions: a) as a repository of the knowledge that schools communicate; b) as a basic instrument for organizing curricula, and c) as a basic tool for teaching and learning (Westbury 1994, p. 5234).

In this study, the roles of the textbook as a source of content and curriculum proved to be very distinct. Teachers used the textbooks as fundamental sources for intended curriculum. Most teachers prepared their lessons with textbooks in mind (strictly speaking also in hand). Textbooks seemed to have a really strong impact, at least on the content. The majority of teachers reported they used textbooks as a source of subject matter, not only for the selection of topics, but for determining scope and

sequence. Moreover, one third of teachers used textbooks as a program for teaching the lessons.

The role of the textbook as a basic tool for teaching lies mainly in its use as a source for student activities. Most teachers set the tasks and exercises and asked questions suggested by the textbook. They used the textbook especially for practicing and testing. In a lesser measure the textbooks served as a basis for discussion and for student motivation. This again confirms the role of the textbook as a tool for teaching.

However, what role does the textbook play in students' learning? In the lessons observed, simple textbook-based activities prevailed. The students mainly followed the text while the teacher explained the content, or the class read the text aloud by turns. The conclusion that can be drawn from the analysis of textbook-based activities is that the textbook represents a source of information for students. However, it does not affect the students directly, but by means of the teacher's exposition and commentary. Students' individual interaction with texts occurred very rarely, and they hardly ever used textbooks in homework. The written homework in English and Mathematics was an exception, but on the whole students did not learn from textbooks. If they ever studied at home they used the written notes in their exercise books as dictated by teachers, and they learned these mostly by rote. The possibilities of textbooks as tools for students' learning seem not to be fully exploited. Nevertheless, three quarters of students regarded textbooks as very useful, but more for teachers who "prepare lessons according to them". The textbooks seem to be of great importance for teaching and thus in mediating students' learning. However, the direct impact on students' learning is questionable.

Horsley and Walker (2005) sought to describe the changing roles of textbooks in transmission, constructivist and socio-cultural concepts of teaching and learning. The conclusions drawn from this investigation suggest that the role of textbooks in lower secondary schools in Ostrava positively corresponds to the transmission concept – whether we like it or not. The textbooks were mainly a source of information and the basis of transmission and to a large degree structured the teaching and learning program. However, it is encouraging that newly appointed teachers seem to be using textbooks for teaching in a more constructivist way.

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