Pupils' learning is fundamentally influenced by the choice of learning materials, their content and, above all, their didactic aspects. However, it turns out that the form of medium with which pupils work is also significant to a learning process. This work presents the results of empirical research that tried to answer the question What is pupil's learning support based on educational resources like and how do pupils reflect on this support? The aim of this research was to describe how support based on different types of educational resources used in class is mediated by a teacher and how pupils respond to this support. The subsequent task was to find out what kind of support the pupils ask for, whether and how they modify the supporting elements in the textbooks. Attention was particularly paid to resources of electronic and multimedia nature.

The methodological design of the empirical part was based on qualitative research procedures [1], [2]. The research sample consisted of a group of respondents - pupils from lower secondary school with whom an in-depth semi-structured interview was conducted through the focus group technique. Respondents were selected by the method of maximum sample variability [2]. Pupils were primarily asked about strategies for using educational texts when learning for class and when they do their homework. In the next step they reflected on possibilities of support that individual sources provide them and thus make their learning easier. The aim of the interviews was to find out how pupils perceive learning support through educational resources they use and to describe which supportive elements they prefer in learning. The result of the research is a categorization of types of educational resources used in relation to the support options they provide to pupils.

Keywords: Textbook, teaching and learning resources, educational resources, printed resources, digital resources.

1 INTRODUCTION

In connection with social, scientific, and technological developments, there are also innovative changes in the education sector. These changes triggered a curriculum reform in Czech schools fifteen years ago, which aimed to improve the quality of education, and to increase the efficiency of its outcomes. The reform was mainly reflected in the content of education (specifications in the focus of schools, certain variability of subjects, time allocation, inclusion of cross-cutting topics, respect for cross-curricular relations, etc.), but it also helped with the explicitness of learning goals, the specification of expected outcomes, and suggested ways of meeting them. Now, this reform is undergoing some revision, and we are seeing the role of teacher and pupil changing, along with the transformation of the curriculum. Teaching is more individualized - the legislative framework of Czech education determines the care for pupils with specific educational needs, as well as for gifted pupils. When confronted with the new conditions of education, it is the teacher's duty to develop their professional competences, and to strengthen their teaching skills.

Research shows that teaching and learning resources which are used by both teachers and pupils are currently undergoing transformation. This is evidenced, for example, by the new conception of the role of the textbook, which has always been considered to be a traditional study artefact. Conclusions from own research [3], [4] demonstrated the fundamental role of textbooks in teaching pupils at lower secondary schools. The results of many studies, including foreign studies, were supported. The textbooks were used extensively in the lessons (for a long time, and with a high frequency), and they also played a key role in the home preparation of pupils for teaching. Teachers relied on the textbook as a source of information, constructing their preparation for teaching, and respecting its methodological guidance for explaining the subject matter. Textbooks, as a construct, helped to create a framework of knowledge, and so, unfortunately, teachers often determined the extent and depth of knowledge in testing. Is this still true today? Given the dramatic penetration of digital technologies at all levels of education, the question arises as to whether this conclusion is still valid after ten years. In
fact, we see the increasing use of electronic resources in schools [5], as well as materials that do not have a primary didactic potential. Strategies that respect the constructivist concept of teaching and the elements that support the pupil in his/her active learning of the subject matter are accentuated. However, these may not correspond to the textbook concept. Is the printed textbook, along with its impact on learning and teaching, retreating into the background? How do the newly used resources now influence the course of teaching and, above all, pupil learning?

A number of foreign studies compare the impact of printed and digital formats on student learning [6], [7], [8]. However, the results are inconsistent. This raises the question of whether differences in applied technologies also lead to differences in learning. The answer is not easy to find in pedagogical theory. In addition, when analyzing studies on the use of digital materials in teaching, we find that experts use different terminology. Electronic teaching and learning materials are often referred to as digital textbooks, digital texts, and digital resources [9]. In other places, we come across the terms electronic resources and e-resources. German studies adhere to the terms educational media (Bildungsmedien) and learning media (Lernmedien) - [10], [11]. In the Czech community, Pedagogical Dictionary defines electronic textbooks as part of multimedia didactic tools [12]. The commercial and popular-science domain uses terms such as e-learning resources or digital teaching materials (DUM), Fraus publishing house offers interactive textbooks. Alter publishing electronic textbooks, and Nová škola publishing multimedia interactive textbooks.

In the presented research, we solve the problem of how printed and digital education resources can support pupils’ learning. Support for pupil’s learning is understood by socio-cultural theories in the sense of constructivist-led teaching. Pupils can be encouraged to learn in ways that teach them to acquire knowledge and skills in a specific way, and cultivate their learning pathways.

Within the context of these theories, we talk about scaffolding. Through scaffolding, the pupil is provided, step by step, with a variety of temporary, individualized support. A more precise definition of the term and its use in the context of learning is still under discussion. In the Czech environment, the conceptualization of scaffolding is completely absent (scaffolding is more often associated with teaching foreign languages, but it does not have the same connotations as in the case of psychodidactic processes in learning processes). However, even in foreign scholarly literature, scaffolding and scaffolding strategies are not understood uniformly [13], [14]. Most often, the authors agree on the gradual help of the learner to develop his/her knowledge and skills until the learner is able to perform his/her tasks independently, and then remove these auxiliary steps. In our research, we strive to ensure that the resulting findings contribute to the conceptualization of the concept of scaffolding within the Czech context.

2 METHODOLOGY

The methodological concept of the whole empirical section was based on qualitative research procedures [1], [2]. In the first two stages of the research, the elements of the textbook with so-called scaffolding potential, the purposes of the use of textbooks within the support of the pupil’s learning, the teachers’ views on the educational resources of an electronic nature, and the direct support of the pupils in the teaching by the teachers were categorized. The third stage of the research presented here concerns the pupils themselves.

In order to describe the supporting role of textbooks and other educational materials, a combination of several methods has been used throughout the concept:

a) analysis of textbooks and other teaching and learning resources (in order to reveal supporting structural elements with scaffolding potential) - stage I;

b) in-depth interviews with teachers (to determine which support elements teachers use in the teaching, and for what reason or reasons) - stage II;

c) direct non-observation in lessons (in order to identify the educational situations in which the support is taking place) - stage III;

d) in-depth, semi-structured interviews with pupils (to identify their needs and reflect on the support provided) - stage III.

If the level and method of support that lower secondary school pupils receive through learning resources is examined, we must first identify which resources are actually used in teaching, and express what potential support they offer in teaching. That is why the first stage of the research focused on the content analysis of textbooks that are most used in individual subjects in schools (note:
in the Czech Republic, teachers can choose from several textbooks for individual subjects so that they can work in mathematics lessons, for example, in one school or class with a completely different type of textbook than in another school/class. The aim was to identify elements that specifically support pupil learning in cognition and metacognition. We did not cover the affective area in the analysis. Earlier research on educational resources has shown [15], [16], that affective components are difficult to identify in Czech textbooks. If they exist in the materials, it is not possible to more explicitly demonstrate their function, and to monitor the potential effectiveness. Supporting elements in basic textbooks were analyzed with respect to their type, purpose, and means [17], [18].

The next phase of the research verified how support based on educational resources can be modified or implemented directly by the teacher himself or herself. The subject of the research was beginning teachers and teachers with long-term work experience. The qualitative research design was anchored in the Corbin & Strauss methodology.

This paper is dedicated to the third stage of research. The subject of this phase was to clarify how teaching and learning resources can support pupils’ learning and during the lessons, as well as outside of the lessons. Particular attention was paid to digital resources and multimedia elements. It discovered what kind of learning support pupils anticipate, and which structural components (or other textbook elements) help them to learn. The theoretical starting point was socio-cultural approaches and the concept of specific support for pupils’ learning - so-called “scaffolding”.

The basic question in the third stage of the research was set as follows: What support, based on educational resources, is provided to pupils, and how do they reflect this support? The aim was to describe, by means of empirical research, from the perspective of pupils, how the support based on educational resources in teaching is mediated by the teacher, and how the pupils themselves reflect this support. Specifically, it investigated what kind of support pupils ask for, which support elements are included in textbooks use, whether and how to modify them. Pupils were also asked whether individual support from the teacher (or textbook) was provided to them.

In relation to the main objective of the third stage of research, these subtasks were identified:

- to carry out non-participation direct observations in the teaching of selected subjects with the aim of creating a draft of semi-structured in-depth interviews with lower secondary school pupils on the topic of support of pupil’s learning through educational sources;
- to supplement the content analysis of printed and digital textbooks from the first phase of research (by identifying and examining other textbook elements and structural components that support pupils’ learning), based on the observation of lessons.;
- construct a deep semi-structured interview with lower secondary school pupils;
- conduct in-depth interviews with pupils, using the focus group technique, and interpret them using atlas.ti software.

The research sample consisted of lower secondary school pupils. First, there was direct non-observation in ten lessons, attended by two observers. The purpose was to describe which teaching and learning resources are used in teaching, and in what learning context. Supporting practices that teachers actually use when applying text resources were followed. Based on this primary finding, we were able to develop a curriculum of questions for the semi-structured concept of interviewing pupils.

Semi-structured in-depth interviews were conducted with four groups of pupils. Respondents and groups were deliberately selected by the method of maximum sample variability [2]. We tried to capture groups of lower secondary school pupils from large housing estates and village schools, pupils with excellent results, and children who were failing at school. The technique used was focus groups. Pupils were primarily asked about learning needs and strategies that are perceived as supportive when learning from textbooks (and other study materials). The interviews were to reveal how pupils perceive learning support through the educational resources they use, and find out which supportive elements they prefer in learning. All of the interviews were recorded, electronically shared, and subsequently encoded by both open and axial handwriting [1], as well as atlas.ti software. In view of the small number of respondents so far, there was no attempt to create a grounded theory, but to pilot the tool for further use in pedagogical terrain.

The interviews were conducted in three areas:

a) Use of textbooks and e-resources in teaching activities - general part
The issues of the first round helped us to acquire an overview of the resources that pupils actually use in the classroom. Pupils should specify the resources in each subject, to what extent, and on what occasions. Furthermore, the task was to specify what textbook activities are most often performed (to answer tasks, fill in exercises, read new subject matter, view pictures, make summaries, etc.). Subsequently, pupils described how they work specifically with the textbook (with the help of a teacher, themselves, in groups, progressing through pages or skipping, choosing exercises or focusing on all tasks, etc.). Other interview questions were about the pupils’ general view of the existence of printed textbooks (whether they should continue to be at school, what they are, what they serve for), and the popularity of digital learning resources.

b) Use of textbooks and e-resources in home preparation for teaching

The second round was used to find out how to prepare pupils individually, with the help of a textbook and other resources. The idea was to find out how different resources help or do not help pupils to do their homework and to repeat the curriculum. They also commented on whether activities with resources are solely induced by the teacher, or with pupils at home on their own initiative. Here, too, attention was paid to the typology of resources used, as well as the level of support, as perceived by the pupils.

c) Promoting self-learning in self education

The questions focused on exposing pupils’ own learning pathways (how they usually learn, what or who helps them or doesn’t help them in learning, if they have “tricks” to support their learning). Pupils should reflect their own learning strategies, which are based on learning resources, and assess whether they are effective for learning. Furthermore, they commented on what qualities a good learning resource should have to support their learning. Pupils also dealt with model situations. They reflected their usual behaviour at school when they did not understand the curriculum (they tell the teacher, they ask for support, they want individual consultations, they learn by themselves, they give up, or they cheat in the test?).

3 RESULTS

The concept of the whole research was formed in two levels - theoretical and the application. Both parts were related to one another, and related to the analytical and research activities within the subject of support of the pupils’ learning through the textbook, and subsequently in the active research in the real teaching. This paper presents empirical findings from the observation of lessons in Czech lower secondary schools and from in-depth interviews with lower secondary school pupils.

3.1 Observation of teaching units

To better understand the use of support strategies in teaching, and to ask pupils about their support needs, we have made direct observations of ten selected lessons. The aim of the observation was to capture and describe situations in which there was specific support for pupils (or for an individual pupil) based on working with text.

3.1.1 Non-participation direct observation of teaching units

The resulting findings were primarily categorized by polarity. These models of support were captured in lessons:

a) support based on the type of text material (support for working with a basic textbook vs. using other learning resources)

b) text-based support (support for working with printed vs. digital sources)

c) teacher-assisted support vs. support requested by the pupil (only one pupil asked for help in ten observed lessons!)

d) support provided at different stages of instruction (in the exposure phase of the lesson - in order to explain the subject matter vs. support in fixation/repetition - in order to consolidate/repeat the subject matter)

e) pupil support within organizational forms of education (support for mass and group teaching vs. individual pupil support; support was not provided to pupils during paired work)
f) intentional support vs. unintentional (out of context of the situation) support

g) author support (the teacher is the bearer for the support) vs. methodological support (the
teacher relies on an existing methodological approach contained in the resource itself)

h) method of mediating support (by using theory vs. support by example from practice, by giving
examples, modelling situations).

Table 1. Support models.

<table>
<thead>
<tr>
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<th>Model 1</th>
<th>Model 2</th>
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<tbody>
<tr>
<td>support based on the type of text material</td>
<td>based on textbook</td>
<td>based on other teaching and learning resources</td>
</tr>
<tr>
<td>text-based support</td>
<td>work with printed resources</td>
<td>work with digital resources</td>
</tr>
<tr>
<td>dependence on the teacher</td>
<td>teacher-assisted support</td>
<td>support requested by the pupil</td>
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<tr>
<td>stages of instruction</td>
<td>exposure phase of the lesson</td>
<td>fixation phase of the lesson</td>
</tr>
<tr>
<td>organizational forms</td>
<td>support for all/groups</td>
<td>individual support</td>
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<tr>
<td>intention of support</td>
<td>intentional</td>
<td>unintentional</td>
</tr>
<tr>
<td>source of support</td>
<td>teacher</td>
<td>methodological guide</td>
</tr>
<tr>
<td>method of mediating support</td>
<td>giving theory</td>
<td>giving examples</td>
</tr>
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</table>

3.2 Interview

The main task of the third stage of the research was the construction and application of in-depth, semi-structured interviews with the pupils. The aim was to find out what support strategies are provided to pupils in the classroom, and which supportive elements pupils use in their own learning - within the teaching, or in preparation for it. Attention is paid to the learning activities and practices that pupils choose for effective learning from the text. For this purpose, a draft of basic topics was elaborated which helped to define the core of the interview with selected respondents. For each topic, there were areas of interest in interviewing specific questions. Subsequently, a battery of questions was created that mapped the issue of pupil support through specific strategies. The questions related to the three areas mentioned above. The proposed research tool - a semi-structured interview for groups of pupils - was first discussed by the team. Subsequently, it was piloted. In particular, it was used to reveal difficult places of conversation, to which the pupils either could not express themselves, or did not understand the formulation of the question. Subsequently, 20 lower secondary school pupils were selected by deliberate selection (see above), with whom the interviews were conducted. The concept of the interview was based on professional preconceptions (e.g. scaffolding, constructivist conception of teaching, etc.), but was verbally appropriate to the age of respondents for the application. Interviews were recorded, and their exact transcription was performed. The statements were coded and analysed. Using atlas.ti software, common features of respondents’ data statements were searched for, which were further categorized.

3.2.1 Semi-structured interview with pupils

The following findings came out of the deep semi-structured interviews with pupils:

- category of level use of the basic textbook: the most common and most frequently used textbooks are used in languages (English, German, and Czech) and in some natural sciences (especially biology and geography);
- category of aim of use of the basic textbook: in school, the textbook is most often used for practising the material, and for languages the text is read (a frequent answer was: “We copy parts of texts or redraw pictures!”); audio materials are often used with language textbooks;
- category of activity with textbook: mostly the textbook is used within a group organizational form or individualized (i.e. pupils have independent work - completion of exercises, description, redrawing of pictures);
- category of work with visual elements: very little work with pictures, graphs, illustrations, and if they do, they do not support the learning of pupils, because mechanical activities are induced
with them (redrawing pictures into a workbook without teacher comments - especially in biology, geography, physics);

- **category of other text resources**: frequently used printed resources are workbooks/worksheets (especially history, English), teachers’ own materials in chemistry, mathematics - “…our teacher uses his text materials …”, language dictionaries;

- **category of pupils’ textbooks and electronic textbooks**: our respondents perceived textbooks as clearer for their own learning, did not consider electronic textbooks to be supportive in terms of learning quality. The reason for this was the identity of their content with products printed or, in some classes, inadequate use by the teacher (merely projecting an electronic textbook on a smartboard without additional benefits – “in the textbook it’s the same as in an electronic schoolbook, we project text on the blackboard”). However, most pupils said they did not have electronic textbooks at school.

- **category of other electronic resources used**: from other electronic sources, pupils reported very frequent use of PowerPoint presentations, PCs and tablets (in computer science, English, and geography); furthermore, video is used (non-didactic - history, physics). Pupils cannot formulate why teachers use electronic resources in their classroom (they usually say “our teacher will use presentations to avoid writing on the board and make learning easier”).

- **category of support in home preparation for teaching (written, oral) through teaching materials**: written assignments are again provided mainly in subjects where the teacher usually requires the use of a textbook. Most often, pupils complement each exercise with writing in the individual exercises. However, tasks they generally do not get very many tasks, and almost never any oral tasks (rather learning by heart). If they are given written homework, the assignment is not explained, but just the exercise number is written on the board. The pupils do not use textbooks to prepare at home for lessons, they use the notes in the workbook. Only one student said she used the textbook for teaching support, and the reason for this was: “the teacher assigns the teaching tasks contained in the basic textbook to the test”. To learn from the textbook and perceive it as supportive for their learning, it would unconditionally offer something very interesting, unusual. In addition, pupils tend to lean on websites for learning support, especially Wikipedia. From printed sources, in Czech language lessons, the reading of books is required in literature.

- **category of self-learning support strategy**: if pupils do not understand something, they seek support from the teacher (they put their hand up); they ask parents, classmates, or look on Wikipedia. If pupils learn from a textbook, then they read (silently or out loud) in the text, and try to memorize the information (learn parrot-fashion), or they make notes or ask parents to test them. When asked what the textbook should help - they answered that it should be clear, contain brief overviews and takeaways. However, most pupils are unable to formulate independently how the textbook could help in learning. Pupils learn intuitively when learning. They say: “nobody explained how they should learn from the textbook, how to work with it” (they had to learn it themselves). When learning, pupils use only mechanical learning methods (recitation, reading out loud), without any difference in school results. Only one respondent said he created a mind map in a difficult curriculum. If pupils could design textbooks to support their learning, they would ask for motivating elements - especially interesting content. Also, textbook support should, according to the pupils, “contain a solution of the learning tasks, and possibly even a summary”.

- **category of printed vs. digital resources**: While it may be anticipated that pupils generally prefer electronic resources, our respondents prefer to learn from printed textbooks (when they are learning). According to them, digital textbooks have the advantages of being more ergonomic “light, portable, available, accessible in the dark”. Pupils did not challenge the benefits of digital resources in relation to learning.

## 4 CONCLUSIONS

This paper continued the research of the role of textbooks and other text materials. The subject of research was the ways in which printed and digital resources can support pupils’ learning. The means of support were viewed through the lens of pupils who testify to their ways of learning, the actual use of educational materials, and their support needs.
Research on support strategies has revealed interesting data on textbook-based pupil learning. From the previous survey, we have primary conclusions about how teachers support pupils’ learning. An interesting achievement would therefore be to monitor how a particular scaffolding phenomenon is directly implemented in teaching, and how it is interpreted by both parties.

Qualitative pupils’ testimonies confirm the results of the studies to date. Pupils do not think too much about how to make their learning more effective. Often, they consider memorizing and mechanical repetition as a supporting learning strategy. Their learning is purposeful and knowledge rather short-term. They do not need a textbook in their home preparation for the lesson, they learn from the notes in the notebook, or they use the internet. They work with the textbook only if the teacher asks for written homework that is printed in the textbook. The addressed lower secondary schools do not use digital media very much or, if they do, the teacher uses them similarly to a printed source. Not surprisingly, what pupils appreciate in textbooks and other educational resources - definitely pictures. Although basic textbooks are still used very often in lessons, activities are often stereotypical (although they often offer creative potential). Children are interested in the benefits of electronic textbooks.

The results of the research cannot be generalized at the moment. Further research and the extension of the group of respondents will be needed. However, it has already shown that although we can capture the changing role of a printed textbook, it still has a fundamental position in lower secondary schools. However, more resources and digital media are added to the lessons that complement the textbook. While in an earlier author’s research [3], [4], pupils reported that their teachers almost never use digital resources (or even PowerPoint presentations), today’s lesson in Czech schools often start with a projector light which goes out when the children leave for lunch.

It is therefore necessary to continue to map the use of teaching and learning resources in teaching, to follow trends in digital media, and to use their advantages in supporting pupils’ learning. Not only as separate sources, but especially in combination with printed materials.

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