Articles

Theory of knowledge space and monitoring of writing process

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Abstract

In the following text we present a possible approach to monitoring of text production process among elementary school pupils. We proceed from a so-called theory of knowledge space and from knowledge dimension of Bloom's taxonomy of cognitive domain. It covers not only facts and concepts but also process and metacognitive knowledge which are integral parts of writing process itself. These are being often missed out during teaching and evaluation of pupils – attention is in many cases incorrectly paid to knowledge of facts and concepts, mostly text models. In the following paper we present part of the findings resulting from qualitative research survey based on the research work with experimental group of pupils aged 13–14.

Keywords: writing, theory of knowledge space, process knowledge, metacognitive knowledge.

Introduction

Current education, not only within elementary schools, is from the perspective of target orientation focused on acquiring of so-called key competences, it means certain summary of knowledge, skills, abilities, attitudes and values, which are important for personal development and finding one's own place in the society (RVP ZV, 2013). One of the key competences is represented by communication competence. These days we

are able to see communication approach prevailing in education. In many cases, all the attention is incorrectly paid to result communiques. Individual phases of creation of texts or verbal speech are accepted as less important and very often they are not part of evaluation of the pupil's activity. It is an orientation on process of creation of communiqué that represents considerable motivational factor. Furthermore, the respect to processional character has also positive influence on text quality and transfer of learned skills and knowledge.

1 Text competence

Text competence should be understood in direct connection with communication competence but also as a part of cognitive competence. This fact corresponds to present conception of mother tongue education that is based on both communication-pragmatic approach and at the same time cognitive approach. Šebesta (2005, s. 60) summarizes all aspects of communication competence and defines it as "a complex of all mental prerequisites that makes human be able to communicate". Namely it is the knowledge of language code, interaction skills and culture knowledge that determine the form of resulting communiqués and influence the effect of communication itself. Communication competence is formed by partial competences, which only as a whole unit makes an individual to be able to effectively communicate in variable communication situations. In the given context, terms as language competence or text competence are being used. Language competence is the ability to use means of individual language plans (morphological, syntactic, lexical and others) towards effective communication and with respect to communication objective. Text competence includes both receptive skills and ability to create texts and thus communicate adequately one's thoughts, evaluations and plans (Portmann-Tselikas, 2005). Text competence is a comprehensive identification of receptive text competence and productive text competence.[1] Apart from verbal speech it covers the ability to create coherent text communiqués through the usage of cognitive, metatext, language and media competence based on the ability to orientate oneself in intermediary media (for example written language) and following application (Schmölzer-Eibinger, Weidacher, 2007).

    Klimovič (2011) is thoroughly concerned with basic objectives and content of the productive text competence development whereas he distinguishes cognitive, meta-cognitive and communication area. O. Hausenblas (2012) is similarly concerned with target orientation of writing education itself. He states three elementary areas: devel-

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[1] It is neccesary to remind that productive text competence cannot be strictly separated from the receptive competence – text recepient must also have knowledge about rules for text creation, about text models etc. Receptive competence is being applied in the whole process of text creation as well (author of the text works with other text materials and receptively process text produced by different author or himself/herself).

opment of coherent thinking (cognitive and metacognitive perspective), support to comprehensive reading (relation to receptive text competence), and development of personal expression (communication perspective).

2 Cognitive and metacognitive aspects of writing process

A lot of approaches to how to define individual phases of process of text creation can be found in expert publications of departmental didactics. Nonetheless, there are differences only in used terminology. Classic concept of writing process is taken for example by Šebesta (2005), who brings 3 stages – invencio, dispositio and elocutio; cyclical rotations take place during the text creation. The process of text creation has been recently divided into 3 phases – prewriting, writing and postwriting (Carroll, 2007 and others). Prewriting includes formulation of the objective, goal of the communication and the topic itself, collecting material and its categorization. Only when the pre-writing stage is finished, the pupil works out microcomposition and stylization. Through this pupil moves to the writing stage, elocutio (Čechová, Styblík, 1998) where he/she chooses language means with respect to recipient and communication objective and he/she consequently organizes tools to form of compact textual communiqué. This stage is followed by postwriting stage. During this stage the pupil reviews own text with respect to the various factors (content perspective, compositional structure, wording level, language perspective).

Within individual stages pupils activate different cognitive processes, which can be stimulated through proper educational intervention. Monitoring of these stages representing the goal of presented research probe is based on the Bloom's taxonomy of cognitive objectives. In the given connection we have to remind that in case of text creation we speak about tasks of complex nature, therefore it is logical that target orientation of the activity touches all taxonomy categories. Moreover, the whole process has cyclical character; it means a repeated activation of cognitive functions takes place. The ability to carry out thought operations of all levels represents precondition for successful management of text creation. This means the ability to stand all levels of Bloom's taxonomy of cognitive objectives (remembering, understanding, applying, analysing, evaluating and creating).

Process of text creation can be also defined in connection with categorization of knowledge dimension. Its revision and enlargement confirms effort to perceive individual teaching tasks just in accordance with its process character.

1. Knowledge of facts: basic elements that pupils must know to be acquainted with discipline and be able to solve its problems. It covers knowledge of terminology and specific details and elements. In connection with the process of text creation we speak about knowledge of method leading to written record of the language,

it means writing system, linguistic terminology, knowledge of vocabulary of the given language, orientation in information sources that can be used when writing the text etc.

2. Knowledge of concepts: mutual relations between basic elements inside larger structures, which allow their mutual functionality. It covers knowledge of classification and categorization, knowledge of principles and generalization, knowledge of theory, models and structure. In relation to writing process the knowledge of individual textual models can be also included in the knowledge of concepts – thus essays and principles of its creation, knowledge of language as a complex structure.

3. Knowledge of process: how to do something, methods of questioning, criteria for usage of skills, algorithms, techniques and methods. It covers knowledge of specific departmental skills, special departmental techniques and methods, knowledge of criteria for usage of relevant procedures. If we look at writing as a process, knowledge of this process is an essential part of pupil's knowledge dimension. Pupil "knows" the process of text creation, is acquainted with the order of individual stages and with criteria of its usage during the composition of communiqué.

4. Metacognitive knowledge: general knowledge of how we recognize and think about our own thinking. It covers knowledge of strategy, cognitive tasks including knowledge of context and conditions. A fundamental part is also represented by self-knowledge in relation to a teaching task. Metacognitive knowledge includes monitoring and regulation of the writing process itself. Pupil therefore acquires not only the procedure but mainly the strategy. Pupils learn to think about themselves concerning a teaching task, it means writing – pupil realizes his/her own abilities, limits etc. (Hacker, 2009, Harris, 2009, Larkin, 2010).

3 Research

The basic objective of the presented stage of the qualitative research was to monitor cognitive and metacognitive processes of older pupils during text production, with focus on detection of possible deficits in both levels. Research survey was participated by 18 pupils aged 13–14 together with the teacher who took part in preparation of the didactical concept and its testing; this was a subject of other stages of the research. In the presented study we present only a part of the research, namely 1st and 2nd monitoring stage that bordered a pedagogical experiment. The experiment was outlined with a view to stimulate cognitive and metacognitive functions of pupils during writing process, it respected the nature of the writing and at the same time it was based on the principles of the method of mediated writing (Málková, 2009, Krejčová, 2013).

During the realization of the monitoring stage of this research survey we used serveral research methods that corresponded to selected qualitative research strategy.

We mainly built on the theory of knowledge space: as stated by Denglerová (2013, p. 210), the theory of knowledge space is a technique "that allows obtaining an idea about knowledge, understanding and abilities of an individual within a certain area." Such knowledge can be arranged to structure, can be analysed and evaluated. The theory of knowledge space works with phenomena of knowledge domain, which means an area (for example educational area, problematic task etc.) composed of partial steps that are necessary to solve out the task. It is the whole process of text production that can be considered as such knowledge (skill) domain. We speak about problematic teaching task that is bordered by two boundary items – formulation of a topic and finished textual communiqué. The space between them is filled with other domain's items – in case of the process of text production it covers cognitive and metacognitive processes, which have to be used by the pupil to produce quality text. The theory of knowledge space further works with so-called knowledge state, which is formed by all items that are correctly being solved by an individual. Denglerová (2013, with reference to authors of the theory) declares that the knowledge state is essential for individual diagnostics – in this connection we remind Feurstein's measures of cognitive functions (Feurstein, 2006), which is based on systematic monitoring of pupil's work and allows to set functions that are deficit.

Within the first and second monitoring stage of this research we were observing which items from the separate stages (prewriting, writing, and postwriting) are known by individuals from the experimental group and to which extent – at first we were monitoring selected areas of the knowledge dimension, namely metacognitive knowledge and process knowledge[2]. In the monitored period, an experimental group worked with two stylistic units – explicatory essay and essay itself. Research tool monitored planning of the whole process (pupils were creating manuals of how to write the given stylistic unit) and it also allowed to monitor writing process itself – the task definition involved the structure of individual items within the knowledge domain. Research tool included sequence of leading questions and assignments that allowed us to monitor the way of activation of the pupils' cognitive and metacognitive processes (pupils were led to verbalize writing procedure and at the same time to put the individual steps through reflexion).

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[2]   Knowledge of facts and conceptual knowledge were subject to the next research stage that was also aimed at the analysis of the resulting communiqués – but again in relation to progress of the whole writing process.

4 Results

Knowledge structure among the experimental group of pupils at process and meta-cognitive level is characterized in the following features:

Factor 1 – perceived academic effectiveness and relationship to the teaching task: writing of texts is a popular activity among the monitored group. The topic and creative freedom represent motivational factors. If pupils have negative relationship to writing, they confess they are not able to orientate themselves in the individual steps and to plan the whole process. The awareness of possible transfer also has a connection to relationship to the teaching task. Based on the research probe we were able to find out that large part of pupils carry out the task without knowing possible future usage of the partial activities or the whole process, at school or outside it. Second group of pupils deals with the teaching task with awareness of the transfer, at level of knowledge (obtaining knowledge about given topic), at interpersonal level (getting familiar with classmates' opinions, sharing their own opinion) or in the area of cognitive processes themselves, which can be used outside the classes (flow of thoughts, reasoning, considering the topic, thinking about something in life, concentration, decision making). Higher awareness of transfer was shown in the second monitoring stage, which means after the experimental intervention, where intermediation of transfer was accented.

Factor 2 – monitoring and knowledge of process: during verbalisation of the solution algorithm significant differences between pupils occurred. Pupils at A level manage to plan the procedure during the task solution, whereas they work with all parts of the knowledge domain – they prove a high level of knowledge of the process. Pupils at B level leave out partial steps in the individual stages (mainly in stage of prewriting and postwriting – although after realization of the experimental intervention the prewriting stage was not left out any more), knowledge of process is therefore partially deficient which signalizes a deficit in the metacognitive area. We observed significantly deficient process and metacognitive knowledge at level C. Pupils plan and carry out limited number of partial steps – they often write off the top of their head, without preparatory and final stage of the text production. They are not aware of the writing's process character; they focus on the text itself only. This discourages them from writing itself; fear from not managing the task is also very often. In the first monitoring stage group B was prevailing, after realization of the pedagogical experiment it was group A that was significantly represented – pupils managed to verbalize used strategy, then use it in the writing process together with awareness of its possible transfer.

Conclusion

Development of pupils' productive text competence has to be perceived and carried out with respect to complexity of the process of text creation. The presented study accents the process and metacognitive level of writing and warns of the need to monitor and evaluate these levels. Research survey's objective is to point out the structure of the process of text creation. During its monitoring we grounded on the theory of knowledge space – therefore we try to define all steps leading to creation of the text. Process and metacognitive dimension presents its inseparable part. Results of monitoring of the pupils within the given areas refer to significant differences between pupils, to positive influence of experimental intervention and to direct the relation between individual items of knowledge domain and quality of the whole process' procedure.

Acknowledgement

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