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CHILDREN'S LITERATURE, TEACHERS AND INTEGRATIVE EDUCATION: THEORY AND SCHOOL REALITY

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Abstract

The paper represents the results of a quantitative research performed at the Faculty of Education, University of Maribor. The aim of the project was to establish the implementation of the concept of integrative education, which was recommended for the first triennium of elementary education in Slovenia in the 90s. The essence of Slovene integration concept should be the following: focusing on the structure and the process of child's assimilation as well as accommodation in/of the structure, his/her ability to communicate the content of the structure and his/her ability to express the process of changing the structure.
Our results show that the majority of teachers follow the recommended curriculum guidelines for integration as the main didactical concept for teaching in the first triennium of elementary school taught as a part of the compulsory Teacher training program - teaching in the first triennium. Nevertheless a big proportion of elementary school teachers (year 1-3) are not entirely aware of the criteria that should be used for integration in the educational process. The same elementary school teachers have difficulties (aware or unaware) with the process of planning and performing the integration concept in the classroom.
Key words: *integrative education, mother tongue education, elementary science education implementation, teacher training.*

Introduction

Integrative education, whole language approach, integrated curriculum, integrated natural science education … are only some of the concepts which were implemented after recognizing that the constructivist model of learning is a predominant theory in psychology, didactics and consequently in special didactics of most sciences taught in elementary and secondary schools. For instance, natural science teachers speak of integrated natural science education and point out the construction of a whole world picture, the development of a child's world outlook and an intense relationship with the environment. In this case, integration should avoid resolving educational content into related/or loosely related fields that expand a child's perception of the world. (Lamanauskas, Vilkoniene, 2008)

Integrative science education includes investigative practices, experience-driven learning and consequently promotes deeper understanding. At the elementary level in particular students' curiosity should be a means for *exploration, questioning* and using *inquiry in the teaching and learning* of natural science. Since natural science is a discipline, that involves the inclusion of other core content ideas as a component and function of exploration, it can (should!?) become a platform for interdisciplinary curriculum. The result of this aspect of teaching and learning natural science is to encourage the relationship between the multiple content and students' interests.

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The purpose of our research was to show, what can happen (or rather what happens) to this very reasonable psychological and didactical theory when it is adopted by teachers and becomes a part of the school reality. We will present the results of the project the aim of which was to establish the implementation of the concept of integrative education based on constructivist learning theory, which was recommended for the first triennium of the elementary school in Slovenia.

The theory of constructivism in the learning process was adopted in Slovenia within the framework of the school reform, which introduced 9 years of compulsory elementary education in the late 90s. In this context the subject of Environmental Studies (ES) replaced the subject of Natural and Social Sciences (NSS). The curriculum for the Environmental Studies was accepted by the National Council for General Education of Republic of Slovenia (Strokovni svet za splošno izobraževanje RS) in the year 1998.

In the chapter *Didactic Recommendations of the National Curriculum for the Environmental Studies* an extra emphasis was placed on the consideration of pupils' experiences and ideas, on children's specific activities, which should be carried out in the first year and which should end with a child's actual product, on the variety of teaching forms (pupils grouping) and methods, on more attention being paid to individual differences in pupils' abilities. The new curriculum for Environmental Studies was evidently based on modern curriculum theory, developmental psychology and didactics. It derives from the learning target and process strategy of the curriculum planning and was based on the constructional and humanistic theory of learning and teaching as well as a greater emphasis of cross-curricular links between subjects and teacher's autonomy (Kordigel Aberšek, Hus, 2007).

Being aware of the fact that improved teachers' autonomy can derive only from teachers' knowledge and their understanding of *aims of the curriculum* and of the *process of a child's construction of knowledge,* the introduction of 9 year compulsory education was accompanied with a the decree from the minister of education, according to whom only those teachers[1] were authorized to teach in the first triennium of the new 9 year compulsory school, who had attended the *Teacher training program – teaching in the first triennium*. This program offered 8 modules, which lasted 180 hours. Teachers had to participate in the program for at least 160 hours. That was the condition for achieving the required level to get a certificate in teaching.

Teacher Training for Implementation of Integration

The curriculum of the *Teacher training program – teaching in the first triennium* included new psychological and didactical approaches which covered all school subjects; one of the main focuses was on the constructivist nature of the learning process and the integrated didactic approach, as the most suitable approach for such process. Constructivism was considered (as Lamanauskas & Vilkoniene explain) as epistemology (philosophical framework) or theory of learning, which argues that humans construct meaning from current knowledge structures (Lamanauskas, Vilkoniene, 2008). In the *Teacher training program – teaching in the first triennium* teachers were taught about the constructivist nature of children's learning, according to which **a child** reacts upon encountering a stimulus, discrepant from previously formed relevant cognitive schemata.

- If the information cannot be assimilated into the appropriate schema, the child attempts to accommodate or change the structure so as to incorporate the new object or event.
- If the new stimulus is widely discrepant from those previously incorporated into that cognitive structure, the child might make repeated attempts to assimilate it, gradually modifying the appropriate structures until the new stimulus can be fully assimilated.

Teachers were also taught about the essence of Slovene integration concept, which should be:

- *focusing on the structure,*
- *focusing on the process of child's assimilation and accommodation in/of the structure,*

[1] being a teacher in Slovenia means: having a university education, for the primary level Elementary education university study program

- *his/her ability to communicate the content of the structure and*
- *his/her ability to express the process of changing the structure*.

This approach evidently exceeded the frameworks of natural and social sciences, taught in the first triennium, and connected them with a child's language competences. The ability to **communicate the knowledge of the structure** and **express the process of changing the structure** can only be developed by means of integration of the language acquisition and aims, which are listed in the **mother tongue (SLOVENE LANGUAGE) curriculum**:

- broadening of the vocabulary,
- acquisition and understanding of sentence structure,
- acquisition and understanding of text structure,
- reading skills,
- reading comprehension,
- writing skills….

Consequently, in the Slovene model of integration for the first triennium science teaching was undoubtedly linked to the subject of Slovene Language and Literature and with its goal: *gaining communicative competence in reading-writing and listening-speaking channels*.

The integration of science teaching and language/reading teaching brought about a dangerous situation, since traditionally in Slovene (and not only in Slovene) schools reading skills were taught and practiced almost exclusively in relation to (children's) fictional texts. This could lead to the prediction that teachers would perform the integration of science teaching in a simplified way: they would choose a poem or a tale that includes one of the science items (an animal, a plant, rain, wind, water as habitat, flying…) as a **literary motif** – and integrate it into the SCIENCE didactic unit. Thus in their opinion they would reach the main aim of integration: THE INTEGRATION.

To avoid such simplifications and misunderstandings the curriculum of the *Teacher training program - teaching in the first triennium* carefully explained the difference between real and fantastic assimilation process, the difference between the informational/explicatory and narrative text structure and the difference between reading and comprehension of children's fiction and non-fiction. Before integrating the children's literature into the science unit, teachers were taught, to consider the following:

- the suitability of integration of natural science teaching in connection to children's non-fiction (informative and explicatory) and
- the suitability of integration of natural science teaching in connection to children's fiction (narrative and poem).

Of course there are no firm rules but the *Teacher training program - teaching in the first triennium* had to give some guidelines. Teachers were taught that they should largely integrate **children's non-fiction into the science curriculum**. The integration of non-fiction could be used as a motivating force to develop content knowledge as well as to stimulate a sense of wonder about the world. Reading non-fiction books could be the vehicle for students to ask questions about the world. Teachers' attention was drawn to the opportunities for students to discover greater content connections and understanding of natural science. Finally it was pointed out that the integration of non-fiction into the natural science curriculum would **promote interdisciplinary learning**, while an integrated approach to teaching would elevate the potential for student learning of both **natural science literacy** and **science content**.

On the other hand **the traps of integration of children's fiction and science teaching** (Kordigel Aberšek, 2009) were pointed out: while reading children's fiction (for instance fairy tales) children do not always get genuine information. The content of fiction can be truth, quasi truth or fantasy and the reader, while reading, never really knows, what is real and what is not.

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As a mater of fact very often the author has no intention to inform the reader about this question. An indefinite border between real and fantasy is very often a central theme of the literary work and the main poetic approach. Reading children's fiction consequently does not contribute to the development of the ability to distinguish the real and the not so real. The division between fiction and reality is not unimportant. It is rather an **essential part in (before) the process of learning**.

The curriculum of the *Teacher training program – teaching in the first triennium* helped to explain to the teachers that the process of distinguishing between reality and fiction in the 21st century is lengthy and much more complicated than it was in the previous centuries. From this point of view a method of integrating children's fiction and science teaching (learning) would not make any sense. In the 21st century the school system simply must help children to learn:

- in which situations they have to use the process of **fantasy assimilation** of new information (and build a parallel mental scheme) and
- in which situations they have to start the process of **reality assimilation or accommodation** of existing relevant scheme and thus start the process of constructing new knowledge/learning (Kordigel Aberšek, 2009).

Teachers were taught that merging children's fiction in one school unit with the process of learning about the nature would be contra-productive from the point of view of (literature) fiction reception and from the point of view of science teaching. To **construct science knowledge** a child must **know when to learn** and **when to have fun**.

Before designing the curriculum for *Teacher training program – teaching in the first triennium* its authors were aware of the fact, that teachers' knowledge is also constructed. In other words teachers construct meaning by comparing their experience with the new information. Therefore the curriculum included some brainstorming about the history of reading curricula and recommended literacy didactics, to remember the proximate connection of reading skills acquisition and children's fiction in recent times when "fine" literature was used exclusively as a medium to practice reading.

Observing the history of literacy acquisition showed that:

- teaching and learning reading was a task, which had to be done during the mother tongue lessons (and during preparing for assessment of mother tongue teachers) and
- mother tongue teachers were hardly interested in reading understanding; for them fluent reading was the final goal.

On the other hand teachers of other school subjects (the majority of social and natural science teachers on secondary I. level) often complained that their students can read, but they do not understand and they do not know how to learn from textbooks. Elementary school teachers were blamed for these circumstances.

At this point elementary school teachers were motivate to accept some information about the theoretical background of didactics of reading comprehension:

- One of the most established findings in reading research is, **that comprehension develops through a variety of purposeful, motivated reading activities**. This means that "reading education" can not be separated from the understanding/processing/learning part, which traditionally happens in (natural) science classes (Guthrie, 2002). **Literacy aims must be integrated alongside science teaching aims** under the following general banner: **reading comprehension and learning through reading**.
- There are rules of how comprehension strategies should be taught. **Comprehension strategies should be taught to students as they are immerged in reading** (Block et al., 2002). This means reading comprehension strategies[2] must be taught in an integrated unit. Teachers should introduce the most effective reading-comprehension strategy simultaneously with the learning process. Reading-comprehension strategies

[2] Comprehension strategy has been identified as the most effective approach at increasing comprehension of the particular text.

for biology learning should be taught (and practiced) simultaneously with biology learning, reading comprehension strategies for learning from the textbook for physics should be taught (explained and practiced) in integration with physics class. Direct instruction in comprehension strategies include teachers modeling and explaining, when and how to use the strategies (Guthrie, 2002).

- Effective comprehension instruction includes different comprehension strategies, modeling, explaining, and facilitating scaffold practice. These comprehension strategies include:
  - making predictions and connections to ideas in texts based on prior knowledge,
  - constructing mental images that represent ideas in texts,
  - asking questions and seeking answers and
  - constructing summaries (Pressley, 2006).
- Teachers have to provide motivational context for reading (Gambrell et al., 2002). The selected text must be appropriate. A **motivational context** for reading is without a doubt the curiosity of students after the successful motivation phase at the beginning of the science class. And which text should be more **appropriate** for learning the effective comprehension reading strategy for biology explicatory and informational texts than the text from the biology textbook or from the children's non-fiction from the biology field? The necessity of integrative *teaching of reading comprehension skills* and *acquisition of contents* can be justified also through the **motivational context** point of view.
- To reach the main aim of reading-comprehending acquisition, teachers must reach the level of developed learning competence. Since this day in age students do not learn only under supervision of their teachers, and since nowadays the learning process does not end with finishing the school (life long learning!), teachers have to develop metacognition, the awareness and management of child's own thought, or 'thinking about thinking'" (Kuhn, Dean 2004: 270). This awareness is developmental and takes the form of a continuum. According to Kuhn and Dean, metacognitive skills do not typically develop to the level that we would prefer. Teachers **can teach student to perform a particular strategy in a particular context**. However, they must strive to guide the students to the metacognitive level of operations so that they are **able to transfer this strategy to other settings once the teachers are no longer providing support**.

In the framework of integrative approach between mother tongue education and science education the **question of background and prior knowledge (mental scheme), vocabulary and text structures** must be taken into consideration (Fisher, Frey, Lapp, 2008).

- As readers, students should always activate their **knowledge base** and **compare it with what they are reading.** In other words, they should compare what they already know with what they are reading. This is the essence of reading comprehension as well as it is the essence of all kinds of learning processes. According to Piaget and the origin of constructivism humans organize information into schemata – a mental representation of related perceptions, ideas or actions – and these schemas are the building blocks of thinking. Knowledge expands by reformulation of what we already know. The connection of knowledge (science) and reading (mother tongue) **can be stimulated and optimized in the integrative science mother tongue-literacy class.**

- Beside knowledge, content relevant mental schema **vocabulary** is one of the best predictors for comprehension. To understand the sentence, students need both, background and vocabulary knowledge. A well taught integration of science and reading class can equip students with vocabulary (new words he or she should learn, to speak about the new knowledge) which happens within the remit of science curriculum

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to open the opportunity for deeper understanding while reading. Historically students have learned vocabulary in "empty space" from a list of words and its translations. Long ago didactics recognized that words should be learned in a context.

- Empirical research has determined that **students' ability to process and remember text is correlated with the ability to recognize text structures**. The recognition of an organizational pattern facilitates memory for information, because it enables the reader to form **a mental representation of the information and to see the logical relationships** advanced by the author (Ogle & Blachowicz, 2002). Most research efforts in this area have been devoted to demonstrating the relationship between structural knowledge and reading comprehension. Thinking about integration of science and reading class we must be aware of existing **two different groups of texts**. On one side we have informational texts and on the other side narrative texts. They differ significantly in their structure. Most common **informational text structures** are compare/contrast, problem/solution, cause/ effect, chronological sequence and description. **Narrative texts** on the other hand also have a common **structure**; they use story grammar (setting, plot, characters, and conflict) and literary devices to signal readers' consideration (Fisher, Frey, Lapp, 2008). For centuries understanding of narrative texts had full attention of teachers. They taught children that stories have a beginning, middle and an end. Children also learned to tell, what is real and what fiction. Later more complex analysis of narrative literature followed. At the same time the understanding of informational **text structures** was neglected. **Integrative teaching** of science and reading comprehension should give the opportunity for acquisition of **knowledge about informational text structures** and the **reading strategies for understanding them**.

Methodology of Research

Key research method was a descriptive and causal non-experimental method of pedagogical research.

In the year 2005 all interested primary school teachers in Slovenia completed the *Teacher training program – teaching in the first triennium.* By then, they all had to transfer the theoretical knowledge about integrative process into the school reality. The research team felt that 2009 would be the right moment to check, what has happened with the constructivist approach in science teaching and integrative didactic approach, when it met the daily routine, to establish the performing of the concept of integrative education, which was recommended for the first triennium of the elementary school in Slovenia in the 90's. According to the curriculum of the *Teacher training program – teaching in the first triennium* which introduced the essence of Slovene integration concept*, we wanted to find out* ***whether teachers understood the criteria for integration of curricular aims. We wanted to know, which school subjects and which contents of different school subjects they integrate and which aims do they intend to achieve with particular integration.***

At the beginning we struggled with the question, how to reach as many teachers as possible and how to reach the variety of school realities. An opportunity came up when observing students in elementary schools during student practice weeks that take place all over Slovenia. We were convinced students would be good observers, since they get a lot of knowledge about integration in the study programs of special didactics in the 3. and 4. year of education. So, 123 students of the Graduate Program for elementary teaching were required to observe the integration approach in the first triennium during the three weeks of student practice in April 2009.

Students were advised to observe integration process in as many classrooms as possible. This observation was carefully prepared and guided.

- Students were required to fill in the protocol sheet. This *protocol sheet* was designed to draw their attention to the frequency of using integrative approach, to the integrated school subjects and to the curricular aims adopted and achieved during the integration.
- As a corrective to the possible subjectivity of students' observation teachers' *school preparations sheets* were also collected and added to the protocol sheets.
- Additional data was collected with an *anonymous questionnaire* for teachers that were handed out by the students, who observed the integration. By means of this questionnaire we tried to find out what are the teachers' attitudes to integrative learning process.

The questioner posed the following questions:

- which school subjects do they use to integrate the subject Environmental Studies,
- which aims from the Slovene language curriculum they target, while integrating ES with Mother Tongue,
- how often do they plan and perform the integration of ES with other subjects,
- with which school subjects do they integrate the subject Slovene language,
- which aims from the Slovene language curriculum do they target when they integrate it with the most frequently selected school subject,
- finally we asked teachers, whether they have difficulties planning and performing the integration and what are the reasons for such difficulties.

During their school practice in the fourth year of their study program, 123 students observed 162 elementary teachers in the first triennium of elementary school. 60 (37.0%) teachers were teaching in year one, 48 (29.6%) teachers in year two and 54 (33.4%) in year three. Teachers, participating in the research had an appropriate level of education. All of them participated and graduated in the *Teacher training program - teaching in the first triennium* and had got *the Certificate for teaching in the first triennium of the elementary school*.

102 students wrote the protocol, collected teachers preparation sheets, handed out the questionnaire, collected the filled in questionnaire and returned the documentation to the research team. The research team performed processing of the data. In the present paper we present the results of the questionnaire.

The data are presented in tables by giving the absolute frequencies (f) and percentage frequencies.

Results of the Research

In the chapter *Didactic recommendations of the National curriculum of the Environmental studies* (ES) an extra emphasis was placed on cross curricular approach and so to integrate the aims of particular ES contents with the aims of other school subjects. The first research question is about the type of chosen integration. We asked teachers "*Which school subjects do you use to integrate the subject Environmental studies"*.

Table 1. Integration of ES with other school subjects of first triennium curriculum.

	5 f	5 f%	4 f	4f %	3 f	3f %	2 f	2f %	1 f	1f %
Music education	23	14.4	39	24.4	53	33.1	34	21.2	11	6.9
Art education	1	0.6	15	9.4	34	21.2	59	36.9	51	31.9
Physical education	49	31.2	51	32.5	23	14.6	16	10.2	10	11.5
Mathematics	74	45.7	39	24.1	31	19.1	14	8.6	4	2.5
Slovene language	12	7.5	12	7.5	18	11.4	28	17.6	89	56

Legend: 5 = most infrequent to 1 = most frequent

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The table shows that the most frequently chosen integration of school subjects in the first triennium is the integration of Environmental studies and Slovene language. This integration extends over more than half of integrated units (56%). The second most frequently chosen integration is that of Environmental studies and Art education (31.9 %). The most infrequently chosen integration is the integration of Environmental studies and Math. At first glance the results are very promising. Most frequently selected integration of ES and Slovene language could make us believe, our teachers understand the connection of knowledge constructing and using language for such science knowledge constructing. But taking into consideration that the integration of Math and ES is not performed (or performed most infrequently) shows the lack of understanding of common aims: thinking of environment and nature in mathematical terms.

The fact that 56% of integrated units are integration of Environmental studies and Slovene language made us inquire which aims from the Slovene language curriculum teachers target while integrating ES with the Mother tongue.

Table 2. Selection and frequency of targeted aims from the Slovene language curriculum integrated in ES.

Aims	f	%
literature education(children's fiction)	41	23.3
dialogue communication	76	46.9
reading and writing of informational text structures	61	37.6
Vocabulary	106	65.4
reading comprehension strategies	114	70.4
Other	0	0

The results in table 2 bring us to the conclusion that the curriculum teachers were introduced to during the preparation for teaching in the first triennium was successfully adopted by them. The majority remember and adopt the essence of Slovene integration concept which connects natural and social sciences education with a child's language competences: ability to **communicate (listen, read, talk and write) about the knowledge of the structure (= environmental knowledge)** and **expressing the process of changing the structure** (= environmental knowledge). They consequently include reading comprehension strategies, broadening of the vocabulary, dialogue communication, reading and writing of informational text structures into the ES/SLO integrative lessons. Still in 23,3% of the cases children's fiction is integrated into the Environmental studies units which is in contradiction with the aims of the Environmental studies curriculum and its basic constructivist learning approach: to adopt and accommodate the existing mental scheme with **correct** data.

The third question of the questionnaire was directed towards the frequency of the integration approach in a month period. Teachers were asked how often they plan and perform the integration of ES with other subjects.

Table 3. Frequency of planning and performing the integration of ES with other school subjects.

Frequency	Daily	Twice a week	Once a week	Twice a month	Once a month	Other
f	17	53	58	11	9	16
f %	10.4	32.7	35.8	6.8	5.5	9.8

From the table above we can see that 90.02% of teachers use integrated approach according to regular sample in their teaching routine. 9.8% of the teachers, included in the table in the category *others* added that they integrate when they feel the integration is needed and when they decide integration would be a useful didactic approach for planed aims. The results show that integrative approach is used as one of the didactical approaches in the first triennium. They also show that the integration is not seen as an obligatory approach where the concept would be superior to the aims of the curriculum subjects.

In the chapter *Didactic recommendations of the National curriculum for the school subject Slovene* an extra emphasis was also placed on cross curricular approach. It was recommended to use integrative approach. In the exact recommendations it was pointed out that the goals from the chapter "Informational and pragmatic use of language" should be integrated with the goals from the Environmental studies and Math curriculum, and the aims form the chapter *Children's literature* should be integrated with the aims of Art education, Music education and Physical education (movement/dancing). We wanted to know how teachers follow these instructions.

Table 4. Integration of Slovene language with other subjects of first triennium.

Frequency	5 f	5 f %	4 f	4f %	3 f	3f %	2 f	2f %	1 f	1f %
Music education	16	10	23	14.4	64	40	43	26.9	14	8.7
Art education	7	4.3	24	14.9	38	23.6	61	37.9	31	19.3
Physical education	94	58.4	40	24.8	11	6.8	8	5	8	5
Mathematics	41	25.5	61	37.9	26	16.1	25	15.5	8	5
Environmental studies	5	3.1	7	4.3	16	9.9	22	13.7	111	69

Legend: 5 = most infrequent to 1 = most frequent

According to expectations we found that the majority of teachers perform integration of Slovene language with the subject Environmental studies (69%), followed by the integration with Art education, Music education, Physical education and Math. These results confirm the results we mentioned in the interpretation of table 1, where we suspected, that teachers do not exactly understand the aim of integration, according to which they should teach children to use the most appropriate reading strategy for a particular type of text. Or in other words: it would be more than useful to adopt reading comprehension in the math class, to teach children how to understand math text tasks and to use this skill for solving math problems.

The fact, that 69% integrated units represents the integration of Slovene language and Environmental studies make us inquire, which goals from the Slovene language curriculum teachers target in such integration. It is a very important question, so in our research we asked about the aims of Slovene language curriculum during the integration, as a control question to the question 2, where we were interested in the aims, when integration stems from the subject Environmental studies curriculum.

Table 5. Targeted aims from Slovene language curriculum during the integration with most frequently selected type of integration with - in the previous question discussed - the most frequently selected school subject.

Aims	f	f%
literature education(children's fiction)	48	29.8
dialogue communication	59	36.6
reading and writing of informational text structures	52	32.3
vocabulary	101	64.0
reading comprehension strategies	103	70.4
other	0	0

Similarly, during the integration which stems from the Environmental studies curriculum, reading comprehension strategies, vocabulary acquisition, dialogue communication and reading comprehension strategies are exposed as the main aims, which are targeted in an integrative unit.

Still, approximately one quarter of teachers expect, their students shall learn to read and understand informational text while reading children's literature and they expect their students shall learn about the environment/reality while reading poems and fairy tales. Such orientation of integration of Slovene language and Environmental studies could lead to the prediction, that teachers perform it in the simplifying way: they choose a poem or a tale, which contains one of the science items (an animal, a plant, rain, wind, water as habitat, flying…) as a **literary motif** and integrate it into the SCIENCE didactic unit. So in their eyes they reached the main aim of integration: THE INTEGRATION.

The last question of the questioner asked teachers about their attitudes toward the integrative approach. They were asked whether they have had (think to have had) difficulties in planning the integrative units. 161 teachers answered this question. One of them rejected the answer. Only 2 teachers (1.2%) admitted, they have had difficulties. 56 teachers (34.6 %) mentioned, they have had **difficulties only *sometimes***. *Teachers were asked to explain why difficulties occure.* Only 25 teachers (15.4 %) explained the source of their troubles. The answers are listed according the frequency of appearing from the most frequent to less frequent:

- "I can not jump ahead in the textbook". Textbooks for different school subject have for integration suitable content "in different place". Some of them are at the beginning of the book, some at the end (7x);
- Curricula form different subjects are planning the content at different times throughout the school year (5x);
- Some contents are difficult to integrate. I get ideas, when it is too late (4x);
- Difficulties occur also, when students are not interested in an integrative class (2x);
- Finding suitable didactic materials requires a lot of time and is sometimes impossible (2x);
- Subject for integrative units are not in the time table on the same day (2 x);
- "When I have no ideas" (1x);
- To many students in the class (1x);
- When there is noting to integrate (1x);
- Because we were told not to integrate literature education and basic literacy (1x).

103 (63.5 %) teachers had **no difficulties** with integration. 55 (33.9 %) teachers made the effort to think about and explain **why** they think they successfully implement the integration. The answers are listed according the frequency of appearing from the most frequent to less frequent:

- "I have been teaching for so many years!" (8 x);
- Aims in curricula for different subjects are similar and easy to connect (7x);
- Contents are "knitted" and the theme can be taught holistically (6x);
- "You have no difficulties, if you know, not all content is suitable for integration!" (6x);
- "After many years of teaching, you do not think about how to teach. Everything goes automatically!" (2x);
- Because integration in unavoidable (2 x);
- Integration is often the shortest way to achieve the goals of two subjects;
- I plane the integration units at the beginning of the school year while planning the time schedule;
- Because all subjects are taught by one (elementary) teacher;
- Integrative approach is more suitable for students at the age when they look at the world holistically;
- If the teacher sees the connection of aims and general competences of a particular subject and curriculum as whole, than there are no difficulties to integrate.

Conclusion

Our results show, the majority of teachers follows the recommended curriculum guidelines for integration as main didactical concept for teaching in the first triennium of elementary school, taught in the compulsory *Teacher training program - teaching in the first triennium*. But still, an important proportion of elementary school teachers (grade 1-3) do not have a clear awareness of the criteria, which they should use for integration in the educational process. The same elementary teachers have difficulties (aware or unaware) in the process of planning and performing the integration concept in their classroom.

Three quarters of teachers made clear in their responses to the questionnaire, that they understand the constructivist origin of science learning process and its connection with the process of gaining communication skills. They understand that integration is not the aim but a didactic tool to reach connected/related goals from (two) different subjects by means of a shorter and more effective procedure simultaneously reaching a higher level of educational quality.

On the other hand it is more than a concerning fact, that one quarter of teachers misunderstand the purpose of the integration approach. Integrating un-integrative contents they spend their and their students' time and energy on activities, which do not lead to any curricular goal.

This is a great pity but nevertheless excusable. What is inexcusable is that in the circumstances their students:

- do not learn how to read and understand informational and explicatory texts from science textbooks and non fictional literature. This means their students do not learn how to learn;
- their students do not develop the proper vocabulary (to listen, speak, read and write) about science;
- their students do not get acquainted to the text structures needed to speak (read) about *their ability to communicate about the content of the structure and ability to express the process of changing the structure*;
- their students do not learn what kind of communication has to be processed by the process of reality assimilation and what kind of communication has to be processed by the process of fantasy assimilation;
- a final and a very important point is that their students do not gain knowledge holistically. This means a quarter of the population will get bit of knowledge about different subjects, which they most likely will not be able to hold on to and gather into an accurate picture of the world they are living in.

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References

Fisher, D., N. Frey, D. Lapp (2008). *In a reading state of Mind. Brain Research, Teacher Modeling and Comprehension Instruction*. Newark, DE: International Reading Association

Gambrell, L.B., Block, C.C., & Pressley, M. (2002). Improving comprehension instruction: An urgent priority. In C.C. Block, L.B. Gambrell, & M. Pressley (Eds.), *Improving comprehension instruction: Rethinking research, theory, and classroom practice* (pp. 3–16). Newark, DE: International Reading Association.

Guthrie, J.T. (2002). Preparing students for high-stakes test taking in reading. In A.E. Farstrup & S.J. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed., pp. 370–391). Newark, DE: International Reading Association.

Kordigel Aberšek, M., V. Hus (2007). Functional literacy and modern ICT technologies. In: *Information & Communication technology in Natural Science Education. International Conference. Proceedings*. Šiauliai, Lithuania.

Kordigel Aberšek, M. (2009). Integrated Natural Science Education and Children's Fiction: an Opened Question. In: Lamanauskas, V. (eds.) *Development of Science and Technology Education in Central and Eastern Europe: 7th IOSTE* Symposium for Central and Eastern Europe. International Conference. Proceedings. Faculty of Education, Šilauliai University. Šiauliai, Lithuania.

Kuhn, D., & Dean, D., Jr. (2004). Metacognition: A bridge between cognitive psychology and educational practice. *Theory Into Practice,* 43(4), 268–273.

Lamanauskas, V.& M. Vilkoniene (2008). *European Dimension in Integrated Science Eucation*. Olomouc: Palacky University, Faculty of science.

Ogle, D., & Blachowicz, C.L.Z. (2002). Beyond literature circles. In C.C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best practices* (pp. 259–274). New York: Guilford.

Piaget, J. (1970. *The child's conception of movement and speed*. New York: Basic books.

Pressley, M. (2006, April 29). *What the future of reading research could be*. Paper presented at the International Reading Association Reading Research Conference, Chicago, IL.

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