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{X} Univerzita Hradec Králové
Pedagogická fakulta

Výroční /průběžná zpráva projektu specifického výzkumu na rok 2017 – zakázka č.2106

Název projektu:
Vliv techniky čtení na čtenářskou gramotnost

Specifikace řešitelského týmu:
Odpovědný řešitel: **Mgr. Iva Košek Bartošová, Ph.D.**

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Celková částka přidělené dotace: 80 809,- Kč

Stručný popis postupu při řešení projektu

Ve svém výzkumu jsme chtěli navázat na specifický výzkum (2016) zaměřený na žáky 1. tříd ZŠ vyučovaných různými metodami čtení, kde jsme sledovali a popisovali čtenářské dovednosti žáků z hlediska rychlosti, způsobu čtení, techniky a částečně z hlediska porozumění čtení. Záměr pokračovat ve výzkumu vycházel z výsledků prokázané statistické závislosti mezi použitou metodou a porozuměním čteného (p=0,002) a možnosti i nadále pozorovat a pracovat se shodnými respondenty (možnost pozorovat vývoj jednotlivých žáku ve čtenářské gramotnosti pro potřeby učitelů).

Výzkum a porovnávání nácviku čtení s následným porozuměním se zatím realizoval jen u metod analyticko-syntetické a genetické a u metody splývavého čtení je opomíjen stejně jako u nově vyučované genetické metody podle Rubínové, která nebyla dosud testována. Proto jsme chtěli využít daného specifického výzkumu a získat nové poznatky v oblasti dalších metod se zaměřením na porozumění textu při různém způsobu čtení (tiché, hlasité, poslech) a také přispět k případné standardizaci testů pro žáky 2. tříd ZŠ.

Popis cílů výzkumného problému

Ve svém výzkumu jsme se zaměřili na porovnání čtenářské dovednosti (porozumění čtenému) žáků 2. třídy ZŠ (shodní respondenti z testování 1. ročníku ZŠ) vyučované odlišnými metodami nácviku čtení: analyticko-syntetickou, genetickou metodou podle autorky J. Wágnerové, genetickou metodu podle autorky J. Rubínové (nově realizovaná metoda nácviku čtení) a metodou splývavého čtení SFUMATO autorky M. Navrátilové.
Dále naším cílem bylo porovnat jednotlivé zkoušky čtení s porozuměním vzhledem ke způsobu čtení – tiché, hlasité a poslech textu.

Výzkumný soubor a sběr dat

Výzkumný soubor tvořilo šest 2. tříd základní školy, 120 žáků, kdy každé dvě třídy byly vyučovány jinou metodou nácviku čtení. Zabývali jsme se metodou nácviku analyticko-syntetickou (70%) nejvíce u nás používanou, dále metodou genetickou podle autorky Jarmily Wágnerové (využívané z minulého výzkumu v 12% v ČR), metodou splývavého čtení SFUMATO (6%) a nově vyučovanou genetickou metodou podle autorky Jitky Rubínové. Šlo o pokračování výzkumu z roku 2016. Stejný vzorek umožnil sledovat posun žáků ve zvládnutí způsobu čtení a jeho porozumění.

Metodologie výzkumu

Bylo využito testové metody - zatím nestandardizovaného testu čtení pro žáky 2. ročníku základní školy určeného k diagnostice čtení se zaměřením především na porozumění čtenému. Využila se zkouška čtení „Jedeme na výlet", která vznikla v rámci tříletého longitudinálního výzkumu porozumění čtenému v projektu *Porozumění čtenému - typický vývoj a jeho rizika*, jednalo se o projekt Grantové agentury České republiky (vedoucí tohoto projektu doc. PhDr. PaedDr. Anna Kucharská, Ph.D.). Šlo o zkoušku tzv. tichého čtení (anglicky silent reading) s porozuměním. Žáci pracovali s testem samostatně, po přečtení textu odpovídali písemně na zadané otázky. Další využitou zkouškou byl článek „Ježek", jež je součástí Pracovního sešitu III k hodnocení čtenářské gramotnosti pro žáky 2. ročníku ZŠ, je volně dostupný jako text sloužící k rozvíjení čtenářské gramotnosti pro žáky, rodiče i pedagogy. Článek četl každý respondent nahlas, samostatně s následným doplněním otázek k článku. K realizaci standardizace článků chybí dostatečně velký zkoumaný vzorek, k čemuž měl náš výzkum přispět.

Postup řešení

Testování se konalo v listopadu a květnu v 2. třídě ZŠ (2016/2017, tedy 3. a 4. zkouška). Vzhledem k rozsáhlosti výzkumu jsme se zaměřili na vybrané výsledky výzkumu žáků 2. ročníku ZŠ (hlavně poslední zkoušku hlasitého a tichého čtení s porozuměním) a na porovnání výsledků z 1. ročníku (2. zkouška testování), tj.. na 2., 3. a 4. zkoušku čtení s porozuměním.

Vybrané výsledky výzkumu

V návaznosti na testování v minulém roce jsme pokračovali ve zjišťování **čtení žáků v závislosti na čase**, zda se zlepšují nebo dochází ke zhoršení u jednotlivých metod (tabulky - viz příspěvek). Z výsledků je patrné, že se více v závislosti na čase zlepšují žáci vycházející z genetické metody. Zhoršení čtení, které na konci 1. třídy bylo nejvýraznější u žáků vyučovaných AS metodou (24 %), tak naopak v posledním testování v 2. třídě mají výsledek nejlepší. Výkony samozřejmě ovlivňuje celá řada faktorů jako např.: délka a obtížnost čteného textu, únava, ale také klima třídy, atmosféra, nervozita, zdravotní stav žáka apod. Proto nelze výsledky objektivně hodnotit podle metody nácviku čtení.

Snažili jsme se dále sledovat při zkouškách hlasitého čtení, jak se žáci **zlepšují vzhledem k vybrané metodě v intonaci,** která přímo souvisí také s porozuměním textu (viz příspěvek). Zlepšení v intonaci je v porovnání 3. a 4. testování výrazné především u metody analyticko-syntetické a Sfumato. Genetická metoda Rubínové zaznamenala pokrok spíše mezi 2. – 3. testováním. Zajímavé je vyšší procento (zhoršení) u genetické metody podle Wágnerové ve 3. a 4. zkoušce oproti zkoušce druhé.

Z ukazatelů vztahujících se ke způsobu čtení bychom chtěli uvést tzv. **dvojí čtení** (viz příspěvek). Jde o nesprávný způsob čtení, kdy dochází ke zpětnému pohybu očí – regresi. Při podrobnější analýze jsme zjistili a bylo zajímavé, že dvojí čtení se během všech testování ne vždy objevuje u stejných žáků. Většinou přetrvává u stejných žáků, u některých došlo ke správné automatizaci hlasitému čtení, ale u jiných se dvojí čtení nově objevilo. Výrazné zlepšení nastalo u AS metody a metody Sfumato v posledním testování, naopak u genetické metody podle Wágnerové je vidět zhoršení. I zde příčinou nemusí být daná metoda (druh textu, únava, intelekt, oslabené dílčí funkce, tréma atd.).

Závěr našeho výzkumu tvořilo 4. testování realizované u žáků 2. ročníku ZŠ v květnu 2017. Jak bylo uvedeno v metodách:

1. Žáci četli samostatně nahlas článek„Ježek" s následným doplněním sedmi otázek s jednou otázkou bonusovou. Danou zkouškou chceme přispět ke standardizaci dané zkoušky, která v ČR chybí s možností realizace pro všechny metody nácviku elementárního čtení. Po testování navrhujeme drobné úpravy.

Největší procento úspěšnosti měla **metoda analyticko-syntetická**. Největší rozdíl v úspěšnosti jednotlivých otázek byla u otázek jedna (žák měl vybrat správný obrázek k textu) a u otázky tři, kde z textu měli respondenti poznat, jaký ježek povahově byl (veselý, líný, chytrý, pracovitý). Zde se shodují výsledky s mezinárodním testováním PIRLS, kde žáci mají problém s elaborací a dedukcí poznatků z textu.

Z hlediska použitého textu článku a následných písemných otázek se domníváme, že některé otázky (3, 4) byly pro žáky 2. ročníků náročné. Test byl na druhou stranu velmi hezky zpracovaný a pro děti přitažlivý.

2. Ke čtenému textu byla použitá zkouška „Jedeme na výlet". Žáci si sami četli text potichu a následně odpověděli písemně na 12 otázek v časovém limitu 15 minut (výsledky viz příspěvek). Také zde se nám zdály určité otázky obtížné (8, 11) vycházející opravdu z dedukce v textu nebo založené na drobných slovních odchylkách. Za pozitivní považujeme otázky typu, co znamená výrok: „ vždy se něco zchumelí".

Pořadí úspěšnosti podle metod opět zůstává nezměněné. Nejlépe dopadla **metoda analyticko-syntetická**. Metoda Sfumato je na 2. místě. Výsledky jsou u některých otázek výrazně rozdílné. Nejvýraznější rozdíl je u otázky 7, činí 48,9 %. Žák měl rozhodnout, který ze tří výrazů se v textu nevyskytuje (vlak, autobus, letadlo). Za zajímavé by stálo porovnat jednotlivé otázky z hlediska typu otázky a z pohledu úspěšnosti dané metody.

3. Pro celistvost diagnostiky jsme zařadili také poslech neznámého textu, abychom zjistili míru porozumění. Tentokrát nejlépe vyšla **metoda genetická podle Wágnerové**, dále pak metoda Sfumato. Zde samozřejmě nejde o porovnání vzhledem k vyučované metodě. Ale je možné předpokládat, že žáci úspěšné genetické metody mají lépe rozvinutý fonematický sluch a sluchovou paměť, kterou daná metoda opravdu vyžaduje.

Shrnutí porovnávaných metod a závěr

Pokud bychom chtěli odpovědět na zkoumanou otázku, **která z metod je nejefektnější z hlediska porozumění čteného**, jde o otázku velmi složitou. Žáci ve svých odpovědích nejlépe porozuměli hlasitému a tichému čtení při nácviku **analyticko-syntetickou metodou a na druhém místě metodou Sfumato**. U hlasitého čtení šlo o rozdíl cca 2 %. Výraznější rozdíl bylo v porozumění textu u tichého čtení. Analyticko-syntetická metoda byla o 11,6 % lepší než metoda genetická podle Rubínové. Nutné by bylo podrobněji rozpracovat jednotlivé typy otázek, dále provést vstupní diagnostiku všech žáků – jejich schopnosti, rozvoj percepcí a intelektové předpoklady. Pořadí v textu jak hlasitém, tak tichém čtení bylo shodné. Výsledky úspěšnosti se pohybovaly v rozmezí 55,4 % (GW) až 67 % (AS).

Z hlediska poslechu, jak bylo již uvedeno se zdá jako **neúspěšnější metoda genetická podle Wágnerové**, což odpovídá způsobu nácviku. Je zaměřená na rozvoji percepcí a to především sluchových – fonematickém sluchu, analýze a syntéze a na sluchové paměti.

Součástí rozsáhlého výzkumu a sledovanou otázkou bylo také statistické testování (Studentův t-test, neparametrický Mann-Whitney test). Pro naši prezentaci jde o **závislost mezi metodou nácviku čtení a dovedností porozumění čteného** (nepředpokládali jsme statisticky významný rozdíl). Vycházeli jsme při testování z formulace nulové hypotézy. **Nebyl prokázán statisticky významný rozdíl** při zvolené hladině významnosti $\alpha = 0{,}05$. **Významný statistický rozdíl se ukázal mezi celkovou délkou čteného, počtem správně přečtených slov u jednotlivých metod** AS a SF ($\alpha = 0{,}05$, $t1{,}4 = -3{,}9054$, $p = 0{,}00019$, $Z1{,}4 = 3{,}5663$, $p = 0{,}000362$) a v metodě GW a SF ($\alpha = 0{,}05$, $t3{,}4 = -2{,}5367$, $p = 0{,}01395$, $Z3{,}4 = 6{,}5531$, $p = 0{,}0000$).

V závěru jsme také porovnávali porozumění čtenému v rámci jednotlivých zkoušek čtení v daných metodách při hlasitém čtení (viz příspěvek). Na konci 1. třídy a během 2 ročníku ZŠ byla nejúspěšnější výrazně metoda genetická podle Rubínové. Překvapivé je, že se v průběhu dílčího testování v rámci jednotlivých zkoušek takto neprojevovala. Z uvedeného výzkumu vyplývá, že jde o proces stále se vyvíjející, kde nelze jednoznačně stanovit, která z metod je nejlepší. Každá učitelka preferuje a vyhovuje ji jiná metoda. Stejně tak žákům podle svých schopností se učí danou metodou lépe nebo hůře. Je potěšující, že někteří vyučující již používají v jedné třídě více metod podle potřeb a schopnosti jednotlivých žáků.

Uvedené poznatky jsou zajímavé a mohou napomoci ukázat směr v získávání poznatků o elementární gramotnosti a volbě správných metodod nácviku čtení. Věříme, že náš výzkum přispěje k rozvoji počáteční čtenářské gramotnosti a vyzkoušené testy přispějí k jejich standardizaci.

Splnění kontrolovatelných výsledků řešení

- Košek Bartošová, I., Jokešová, A., Kozlová, E., Matějová, H. The Influence Of Technology On Reading Literacy. *The European Proceedings of Social & Behavioural Sciences EpSBS*. Porto : Zafer Bekirogullari, Melis Y. Minas & Roslind X. Thambusamy, 2017. 13s. ISSN: 2357-1330.

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Přehled realizovaných výdajů:

a) **Osobní náklady**   *3886,01 Kč*

b) **Stipendia**   *17500,00 Kč*

Za práci na výzkumu (testování žáků v 2. třídách, zpracování výsledků do tabulek a grafů, práce v excelu a pomoc při zpracování publikačního výstupů a prezentace pro studenty).

c) **Materiálové náklady a literatura**   *12 528,54 Kč*

Papíry a kancelářské potřeby potřebné ke zpracování dat; literatura, tonery na tisk materiálů

d) **Další provozní náklady nebo výdaje a jejich stručné zdůvodnění**   *0 Kč*

e) **Náklady nebo výdaje na služby**   *25 516,01 Kč*

Uvedená částka (559 EUR) sloužila na zaplacení konferenčního poplatku ICEEPSY 2017 : 8th International Conference on Education & Educational Psychology.
Překlad a jazyková korektura jednoho rozsáhlého odborného článku do anglického jazyka
Tisk plakátu s výsledky výzkumu

f) **Doplňkové náklady nebo výdaje v souladu s příslušným řídícím aktem UHK**   *875,48 Kč*
        Bankovní poplatky, kurzovné ztráty a zisky

g) **Cestovné**   *20503,95 Kč*

Uvedená částka byla použita na dopravu (letenka + místní doprava) na18th International Conference on Education, Research and Innovation, náklady na ubytování, diety a pojištění

Celkem   **80 809,99 Kč**

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Seznam příloh

Příloha č. 1 - Příspěvek (RIV ID: 50013609) http://dx.doi.org/10.15405/epsbs.2017.10.31
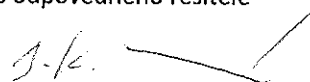Příloha č. 2 - OBD – příspěvek tvoří součást záznamů v OBD
Příloha č. 3 - Výsledovka (výpis z Magionu – prac. 01240, zakázka 2109, činnost 1210)
Příloha č. 4 - Certifikát z prezentace na konferenci

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8th ICEEPSY
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The Influence of Technology on Reading Literacy

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Abstract

The paper presents results of a research team from the Faculty of Education, University of Hradec Králové in the Czech Republic. It lists the most common methods used to teach reading in primary schools (the analytical synthetic method, the genetic method and the Sfumato flowing reading method). It presents results of a pilot research focused mostly on reading comprehension in pupils from the second year of primary schools. During this period pupils' reading technique becomes automated, which provides space for them to focus more on reading comprehension (text's elaboration). The testing took place in the school year 2016/17 and focused on quantitative and qualitative parameters of reading performance of 2nd year pupils taught by different methods. The contribution tries to identify the most effective teaching method from the perspective of reading comprehension. General conclusions cannot be drawn from the obtained data. The text in the test was newly implemented (it has not been investigated in the Czech Republic so far) with the use of silent reading, loud reading and listening and the effect of the three different modes on reading comprehension was observed. The research clearly shows that children undertstand text the most when they do not read it themselves but listen to it instead.

1. Introduction

World organizations dealing with research into reading literacy focus mainly on the functional nature of reading which they regard as a process wherein a reader employs several methods, skills and strategies to understand the text and apply the knowledge effectively. Reading is a necessary tool for acquiring knowledge and reaching further goals which are essential to success at work as well as in the personal environment and in society (Procházková in Realizační tým projektu Metodika, 2008).

The concept of reading literacy appears fairly often, especially in the context of the international reading literacy research PISA (Programme for International Student Assessment) and PIRLS (Progress in International Reading Literacy Study). International assessment research into pupils' skills (PISA, PIRLS) is carried out within agreed conceptual and methodological frameworks.

The project involves 34 member countries of the OECD (Organisation for Economic Co-operation and Development) 32 more countries. The testing takes place every three years. When studying individual national reports, we noticed the interesting fact that pupils obtained the lowest scores at tasks focused at gaining information from the text.

The international survey, PIRLS, directly focuses on the testing of reading literacy of 4th grade primary schools' students. The testing is coordinated by The International Association for the Evaluation of Educational Achievement – IEA). The PIRLS cycle survey lasts for five years. The last one took place in 2016. Within the survey PIRLS, reading literacy is regarded as a creative and interactive process emphasizing the functional characteristics of reading. Readers are expected to master reading strategies, to apply existing knowledge and experience, and prove their ability to think and form their own ideas about the text (Pirls, 2012). Pupils from Czech schools have inferior scores in some of the tasks; therefore our purpose was to find inspiration for improvements in other countries where better results are reached (Finland, Singapore and Hong Kong, Russia etc.)

The findings lead us to the question whether the ability to understand and interpret the texts is affected by the methods employed to teach reading.

In this pilot study we would like to build on our previous research (Košek Bartošová et al., 2016) focused on 1st class primary school pupils taught to read by several methods. We monitored and described pupils' reading skills in terms of speed and way of reading, reading technique and reading comprehension. The decision to continue with the research was motivated by the fact that results showed a correlation between the employed method and reading comprehension (p=0,002) and also the possibility to monitor and work with the same respondents. In the 2nd year of Primary School, pupils' reading technique becomes automated, which gives the pupils' the chance to focus more on reading comprehension (text elaboration).

The analytic-synthetic method (hereinafter AS) is the basic and historically the oldest method used in the Czech Republic in around 70 % of cases. The second option in our country is the genetic method (12 %), which is popular for its smooth transition from kindergarten for first class of primary school, which relies on letter writing practice, speech sound and reading (the original method has been modified by Jarmila Wágnerová and also newly by Jitka Rubínová). Lastly, the purely Czech method the SFUMATO (6 %) developed by Mária Navrátilová has been gaining major importance (Košek Bartošová, 2016).

So far, research and comparison of reading comprehension practice have worked with the analytic-synthetic and the genetic methods. The flowing reading method – the SFUMATO has been neglected as well as Rubínová's new version of the genetic method, which has not been tested yet. By providing new knowledge in the field of the researched methods with the focus on reading comprehension and using

different ways of reading (loud, silent) we would like to contribute to possible standardization of tests for pupils of 2nd class of primary schools in the Czech Republic.

1.1.Theoretical basis.

In order to provide a better orientation in the present issue and the methodology of elementary reading practice we first present the researched teaching methods.

"When comparing analytic-synthetic and genetic methods of reading, it is essential to follow current psychological, pedagogical and linguistic knowledge. The main objects of comparison are the process of familiarization with letters, the ways of using scriptologic methods, the way of reading being taught, the quality of texts compiled for the methods" (Košek Bartošová*, 2016).

The analytic-synthetic method teaches all four letter shapes used in the Czech Republic at a time (Figure 01). Pupils analyze the sound of the word by ear and assign the appropriate letters to sounds. The method relies on a synthesis of sounds into syllables and syllables into words.

The genetic method by Jarmila Wágnerová assigns only one shape to a letter and that is the capital letter (e.g. A). It stems from intuitive reading by spelling. The pupil first spells the word and then repeats it as a whole (e.g.: s-c-h-o-o-l> school). Learning the remaining letter shapes is based on the transfer principle. Such gradual learning of the alphabet in the genetic method (hereinafter GW) is less burdening to memory in comparison with memorizing all the four letter shapes in the AS method. On the other hand, GW is demanding in terms of auditory memory and phonemic hearing (Košek Bartošová et al., 2016).

The version of the genetic method introduced by Jitka Rubínová (hereinafter GR) has been used for a very short time in our country. It assigns two shapes at once to a sound, namely the capital and the low case block letters (e.g. A, a). The remaining two letter shapes are taught after fixing the knowledge of the font-shaped letters, which is the same as in the genetic method according to Wágnerová (Gejgušová, Labischová, Metelková Svobodová, 2015).
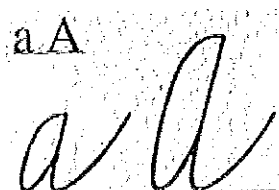

Figure 01. The four shapes of the letter A

It is interesting to compare different forms of the scriptolegic method. Reading and writing are closely linked activities and should be practiced concurrently. Learning reading by writing is called the scriptologic method and it is employed within the genetic method. "The reading technique in the AS method as well as the genetic method is based on the synthesis of phones which assumes the knowledge of letters for individual phones. The two methods differ in the target unit of the synthesis of phones (speech sound). The analytic-synthetic method of reading has the syllable as the target unit, while the genetic method has the word" (Košek Bartošová*, 2016).

The connection between the mechanical and the mental processes in elementary reading practice is highly important. Reading does not involve only mastering the technique but it also requires the mental process leading to comprehension. Understanding the meaning of what is read is an essential feature of reading and it is also its ultimate goal. Thus, we assume that the genetic method (GW and GR) combines the mechanical and mental processes earlier than the AS method. The synthesis of phones (phone technique) with subsequent global reading allows pupils to read whole words right after they know the letters. Reading syllable after syllable as proposed in the AS method has its sense as well, because the pupil performs a smaller number of eye fixations than when s/he reads by phones. Both of these methods are being monitored in the Czech Republic by Radana Metelková Svobodová (University of Ostrava)

with the help of the eye tracking method (Kucharská, Barešová, 2012).

The method of flowing reading – the SFUMATO is based on blended reading in legato style. Individual phones directly follow each other. The basis is the classic analytic-synthetic reading method. Pupils learn all four letter shapes together. Individual organs involved in the learning process are linked one to another in the sequence sight-voice-hearing. Eyes fix letter after letter, children speak loudly, do not stop their breath nor change voice tone. First, they learn letters in the order O, S, B, U, A, M. Eye fixation on a letter is highly important as well as working with a pointer. Only at the next stage when two letters are linked together, the so-called saccadic eye movement forward appears. The next stage is joining three or more phones (Bartošová, 2014).

2. Problem Statement

The purpose of our research was to compare reading skills (reading comprehension) of 2nd class primary school pupils who were taught to read by different methods in the Czech Republic.

The proposed research follows a project implemented in 2016, whose primary objective was to compare 1st grade primary school pupils' reading skills taught by different practice techniques, i.e. the analytic-synthetic method, the genetic method by Jarmila Wágnerová, the genetic method by Jitka Rubínová and the SFUMATO method of Mária Navrátilová. The focus was on reading comprehension.

Diagnostic methods of reading exist abroad as well as in the Czech Republic, which enables us to measure the level of reading technique in terms of its speed, way of reading or a qualitative and quantitative assessment of mistakes in reading or comprehension. There are some problems, mainly in the standardization of the methods, obsolescence of norms or tests' availability. Therefore, it is necessary to create space for the introduction of new diagnostic methods which would take into an account possible differences between pupils who are taught by different early reading methods. Apart from the already mentioned researchers of Kucharská, Barešová, Rabenhauptová (2010, 2011, 2012), where authors examined reading skills of 1st and 2nd grade primary school pupils taught by various reading methods, a project called Porozumění čtenému – typický vývoj a jeho rizika ("Reading comprehension – typical development and its risks", Grant agency of the Czech Republic, led by doc. PhDr. PaedDr. Anna Kucharská, Ph.D.) had the objective to create a new testing battery for reading diagnostics. The longitudinal research study examines the development of reading comprehension between the 1st and he 4th year of primary school (Kucharská et al., 2015).

In the paper we deal with the issue of results' comparison, trying to find out which method is the most effective one and the most suitable one for a pupil in his/her early stage of elementary reading practice. Each of the listed methods has its supporters as well as its opponents. We should consider the fact that our research (2016) and also the researches of Kucharská (2015) and Svobodová Metelková (2015) all confirm that some issues with a given method may be present for a limited time and then disappear. This means that the individual methods of practice influence reading comprehension only during a certain period. For example, the essence of the genetic method is that reading is associated with meaning from the beginning, therefore reading comprehension is developed from the earliest stage of learning. On the contrary, in the analytic-synthetic method it is necessary to learn the technique first – syllables training and subsequent transition to reading fluency. Only after mastering the technique are we able to understand the text (Košek Bartošová, 2016).

3. Research Questions

In our extensive research we focused on multiple aspects of the acquisition of reading technique (namely speed, way of reading – double reading, intonation, improvement/worsening in time; reading technique – confusion of letters, letter ommissions, reversing, additions etc.) and their dependence on the

teaching method. In the present paper, we will focus mainly the most interesting question from the perspective of teachers but also the public, i.e.:

Which of the examined methods seems to be the most effective one in teaching reading literacy (focused mainly on reading comprehension)?

Is it possible to prove statistical dependence between the method of reading practice and reading comprehension skills?

Which reading technique (loud reading, silent reading, listening) enabled the best understanding of the text and the best answers to questions on the part of the respondents.

4. Purpose of the Study

The aim of the research is to continue the survey with 120 respondents (make use of the already existing extensive sample as well as the interest of teachers and school leaders in given issues). In the 1st year of primary school we paid attention mainly to the way, technique and speed of reading and we examined early reading comprehension taught by several methods (the analytic-synthetic, the genetic method of J. Wágnerová, the genetic method of J. Rubínová – a newly implemented method of reading practice) and the method of flowing reading the Sfumato developer by M. Navrátilová). Now we want to present the most common method of reading in primary schools in the Czech Republic and the results of a pilot survey that focused on the quality of reading comprehension in pupils of 2nd class of primary schools. The authors' purpose is to evaluate reading skills (reading comprehension) of 2nd grade pupils of primary schools taught by different methods of reading practice and to compare tests of reading comprehension based on different ways of reading – silent, loud and listening to text.

5. Research Methods

We have used a quantitative research method corresponding to the preset aims – a non-standardized test of reading for pupils of 2nd grade of primary school designed for reading diagnostics with the focus on reading comprehension (additional questions).

A so called probation "Jedeme na výlet" – (Let's go on a trip) was used together with the text that was being read. The text was created within the framework of a three-year longitudinal research into reading comprehension in a project called Porozumění čtenému - typický vývoj a jeho rizika. – ("Reading comprehension – typical development and its risks", funded by a Grant agency of the Czech Republic and lead by the project leader doc. PhDr. PaedDr. Anna Kucharská, Ph.D.). It is a test of so-called silent reading with comprehension. Pupils work individually with the test and subsequently answer questions in the written form.

Another test was called "Ježek-Hedgehog" at it is a part of Workbook III for reading literacy evaluation of 2nd year primary school pupils, it is freely available as a text suitable for development of reading comprehension for pupils, parents and also teachers. It originated on an occasion of a project called Rozvoj čtenářských kompetencí v prostředí inkluzivní školy – The Development of reading competencies in the environment of an inclusive school. The article was read by each respondent out loud, individually and subsequently answered the questions concerning the article. Our research could contribute to the implementation of articles' standartization as the research sample available for this purpose so far is not big enough. Reading tests were selected deliberately according to the possibility of results comparison. Test standardization of reading for the genetic method and the flowing reading has not been done yet.

For the sake of diagnostic integrity we have also included listening to an unknown text, in order to ascertain the level of comprehension (also not implemented in the Czech Republic yet).

Descriptive statistics quantities and Chi-quadrate independent test were used to for a contingency

table. Pearson's correlation coefficient was used with selected questions. A non-standardized test for pupils of 2nd year of primary school was used as a reading test. Additional questions were created for the text.

5.1. Research Sample

Research sample consisted of six 2nd primary school classes (120 pupils).

Table 01. [Number of tested pupils]

Method	Girls (number)	Boys (number)	Sum
Analytic-synthetic (AS)	22	19	41
Genetic method by Wágnerová GW)	10	9	19
Genetic method by Rubínová (GR)	13	7	20
The SFUMATO method (SF)	19	21	40

Two classes had been taught by the analytic-synthetic method (Primary school in Hradec Králové and Primary school in Vysoké Mýto), two classes had been taught by the SFUMATO (Primary school in Hradec Králové) and one class was taught by the genetic method by Wágnerová (Primary school in Sedlčany) and at the same time one class used the genetic method by Rubínová (Primary school in Hradec Králové). This is a continuation of previous research from the year 2016. The fact that we work with the same sample enables to monitor improvement of individual pupils in terms of mastering the way of reading and comprehension, but this is not the subject of the present paper.

6. Findings

During a period of two school years, we were comparing and investigating the analytic-synthetic method, the genetic method (GW, and GR) and the SFUMATO method in terms of qualitative features (way of reading, technique and comprehension), as well as quantitative features of reading (speed).

The first and second testing were implemented in the half term and at the end of the school year (2015/2016) in 1st class, the third and fourth testing's took place in November and May in 2nd primary school class (2016/2017). Due to the scale of research we will focus in our paper only on some selected research results of 2nd year primary school pupils (mainly the last test of loud and silent reading comprehension) and on results' comparison with 1st year, i.e. 2nd, 3rd, 4th reading comprehension probation.

6.1. Way of Reading

We presume that the quantitative feature of reading – speed is not one of the most significant ones during reading practice and subsequent comprehension. We often encounter the situation when pupils learn to handle reading technique quickly, but still have problems with comprehension and text reproduction. No significant difference between individual methods was apparent in the number of correctly read words during loud reading (deviation 1%).

We further monitored how the level of pupils' reading changed in time, whether they were getting better or worse in dependence on the teaching method (Table, 02, 03).

Table 02. [Way of reading on time – improvement (%)]

Method	2nd testing (1st class)	3rd testing (2nd class)	4th testing (2nd class)

Analytic-synthetic (AS)	24	22	4
Genetic method by Rubínová (GR)	34	16	10
Genetic method by Wágnerová GW)	18	32	10
The SFUMATO method(SF)	19	26	4

In the 4th testing there is a significant percentage decrease in comparison with the previous tests — a possible reason for this might be the ability of pupils to manage reading of an unknown text without any problems right at its beginning, which prevents the need for the so-called "reading take off". It is clear from the table that pupils taught by the genetic method are getting better depending on time.

Worsening in reading at the end of the 1st year was the most marked in pupils who are taught by the AS method (24 %), on the contrary, in the last testing the AS method had the best result. The performance, of course, is influenced by a number of factors such as length and difficulty of the text, tiredness, but also school climate, atmosphere, nervousness, pupils' health condition etc. Therefore, the results cannot be objectively evaluated according to reading practice method.

Table 03. [Way of reading text on time — worsening (%)]

Method	2nd testing (1st class)	3rd testing (2nd class)	4th testing (2nd class)
Analytic-synthetic (AS)	24	14	18
Genetic method by Rubínová (GR)	19	12	19
Genetic method by Wágnerová GW)	4	9	20
The SFUMATO method (SF)	17	31	27

During tests of loud reading, we tried to monitor, how the selection of a particular method affects the improvement of intonation, which is directly related to comprehension (Table 04). Here, as well, there is a visible influence of nervousness, tiredness, atmosphere etc. Intonation improvement between the 3rd and the 4th testing is found mainly in the analytic-synthetic method and the SFUMATO. The genetic method by Rubínová shows some progress rather between the 2nd and the 3rd testing. An interesting point is that with the genetic method by Wágnerová, the percentage in the 2nd testing is higher than in the 3rd and 4th, which suggests worsening. Considering the fact that this section examined two categories together (good intonation and the effort to intonate), the high score in the 1st class suggest that the pupils showed the effort to intonate and later the pupils already intonated correctly.

Table 04. [Way of reading – intonation (%)]

Method	2nd testing (1st class)	3rd testing (2nd class)	4th testing (2nd class)
Analytic-synthetic (AS)	32	42	74
Genetic method by Rubínová (GR)	39	56	58
Genetic method by	74	55	57

Wágnerová GW)			
The SFUMATO method (SF)	49	38	63

We would like to mention so-called double reading, which is one of the indicators related to reading (Table 05). It is an incorrect way of reading, where the eyes return – regression. The pupil first reads the word in a whisper or just by eyesight and then reads it out loud. When this mistake becomes fixed, the speed of reading decreases, there is a higher eyesight tiredness and tiredness in general and it is hard to unlearn. That is why we try to prevent bad habits from the beginning.

A more detailed analysis brought the interesting finding that double reading does not always appear in all tests in the same pupils. It usually persists with the same pupils, some of which successfully automate loud reading at some point but double reading newly appears in other pupils.

Table 05. [Way of reading – double reading (%)]

Method	2nd testing (1st class)	3rd testing (2nd class)	4th testing (2nd class)
Analytic-synthetic (AS)	20	22	4
Genetic method by Rubínová (GR)	8	16	13
Genetic method by Wágnerová GW)	4	4	13
Method SFUMATO (SF)	15	5	6

The table above shows a clear improvement in the AS method and the SFUMATO method in the last testing and, on the contrary, worsening in the genetic method by Wágnerová. The cause, again, does not have to be the method itself (but also text type, tiredness, intelligence, weakened partial functions, stage-fright etc.).

6.2.Reading comprehension – method comparison

The conclusion of our research was arrived with the 4th testing in 2nd year primary school pupils in May 2017. As described in the methodological section:

1. Pupils were individually reading the article "Hedgehog" out loud and subsequently completed seven questions plus one bonus question (Table 06). Here, we would like to contribute to the standardization of the test, which is missing in the Czech Republic. It should be possible to use the test with all methods of early reading. The testing led us to suggest minor adjustments to the test.

Table 06. [Comprehension – loud reading (% correct answers)]

Method	1	2	3	4	5	6	7	Bonus	Sum
AS	70,7	78	97,6	46,3	22	92,7	56,1	61	65,6
GR	80	81,7	85	20	25	90	50	80	64
GW	78,9	77,2	89,5	15,8	15,8	100	57,9	78,9	64,3
SF	97,5	80,8	70	30	30	82,5	57,5	62,5	63,9

The analytic-synthetic method has the highest percentage of success. All in all, the results for the individual reading methods are almost balanced. Significant difference in success rates concern only questions one (a pupil should have selected the correct picture based on the text) and in question three where respondents were expected to know the hedgehog's character from the text (happy, lazy, clever or hardworking). These results are consistent with the international testing PIRLS, where pupils face problems with elaboration and deduction of knowledge from text.

As for the employed text and the written questions, we presume that some questions (3, 4) were demanding for 2nd year pupils. They often asked for an explanation, which, according to the instructions, could not have been given. On the other hand, the design of the test was very nice and attractive for children.

2. Silent reading was tested by a probation called "Let's go on a trip". Pupils read the text individually and silently and then they answered 12 questions in the written form in a time limit of 15 minutes (Table 07). Here again, we considered some questions demanding (8,11). These involved deduction from the text or minor differences between words.

Table 07.   [Comprehension – silent reading (% correct answers)]

Method	1	2	3	4	5	6	7	8	9	10	11	12	Sum
AS	82,9	92,7	70,7	68,3	39	90,2	53,7	31,7	73,2	75,6	63,4	63,7	67
GR	65	80	65	45	20	80	70	30	70	75	25	40	55,4
GW	68,4	94,7	68,4	73,7	5,3	89,5	21,1	36,8	78,9	73,7	31,6	73,7	59,7
SF	70	90	72,5	55	30	70	40	35	80	77,5	42,5	72,5	64,6

Therefore, the ranking of methods according to test score remains the same. The analytic-synthetic method was the best. The SFUMATO method takes 2nd place. There are some significant differences in the results for individual questions. Success rates for different methods differ by 10 – 20 % (question 1, 4, 5, 6, 11 and 12). Only questions 8, 9, 10 have similar success rates of all methods. The most striking difference is found in question 7, where the greatest difference is 48,9 %. Here, pupils had to decide which of three proposed expressions does not appear in the text (train, bus, and aeroplane). Interestingly, it would be worthwhile to compare individual questions in terms of question type and the efficiency of different methods.

3. Listening to an unknown text was included for diagnostic integrity in order to ascertain the level of comprehension (Table 8).

Table 08.   [Comprehension – listening to reading (% correct answers)]

Method	1	2	3	4	5	6	7	8	9	10	Sum
AS	78	26,8	80,5	78	92,7	92,7	87,8	65,9	78	73.2	75,4
GR	60	35	70	70	75	85	90	70	84,2	35	67,4
GW	94,7	57,9	94,7	73,7	89,5	100	89,5	89,5	100	89,5	87,9
SF	92,5	45	82,5	75	90	87,5	95	82,5	90	70	81

This time, the genetic method by Wágnerová was the best followed by the SFUMATO method. I

listening, of course, a comparison based on the teaching method seems irrelevant. However, it is possible to assume, that pupils taught by the successful genetic method have a better developed phonemic hearing and hearing memory, which are required by the given method. Differences for individual questions are significant, mainly in questions 1 and 10, there is a difference up to 54,5 % between the two genetic methods. Pupils had to colour pictures according to what they had heard in a story. The question was highly demanding as it required attention to detail. It was superfluous from our point of view.

6.3 Summary of Compared Methods

Answering the research question which method was the most effective one from the perspective of reading comprehension is rather difficult. The highest scores in loud and silent reading were reached by pupils taught by the analytic-synthetic method, the second place belongs to the SFUMATO method. In loud reading, the difference was ca. 2 %. The differences in reading comprehension in silent reading were more significant. The analytic-synthetic method outscores the genetic method by Rubínová by 11,6 %. It would be necessary to elaborate individual types of questions in more detail and make entrance diagnostics of all pupils – their abilities, perception development and intellectual capacities. The results for loud and silent reading seemed the same. The success scores ranged from 55,4 % (GW) up to 67 % (AS).

As for listening, as mentioned previously, the most successful method seems to be the genetic one by Wágnerová, which corresponds to its nature. It is focused on the development of perception and mainly hearing – phonemic, analysis and synthesis and auditory memory. This is why the success rate is 87,9 % in listening. An interesting point for a deeper analysis would be to find out why pupils taught by the genetic method by Rubínová (based on a similar principle) have worse results - 67,4 %. Whether there are external and internal factors or whether there is a connection to the practice method.

One of the components of the extensive survey and also one of the questions was statistical testing (Student's t-test, nonparametric Mann-Whitney test). In our presentation, we talk about the dependence between reading practice and reading comprehension skills (we had not predicted any significant difference). We had a null hypothesis formulation for the testing. No statistically significant difference was found on the chosen level of significance $\alpha = 0,05$. A significant statistical difference was seen between the total length of the text and the number of correctly read words between AS and SF ($\alpha = 0,05$, $t1,4 = -3,9054$, $p = 0,00019$, $Z1,4 = 3,5663$, $p = 0,000362$) and between the GW method and SF ($\alpha = 0,05$, $t3,4 = -2,5367$, $p = 0,01395$, $Z3,4 = 6,5531$, $p = 0,0000$).

Finally, we would like to compare reading comprehension during loud reading in different testing in dependence on the teaching method (Table 09).

Table 09. [Reading comprehension – comparison $2^{nd} - 4^{th}$ testing]

Method	1st class Picture order (%)	Fill in text (%)	2nd class (November) Narration (%)	Open questions (%)	2nd class (May) Written answers (%)	Sum (%)
AS	58,5	56,1	54	62	65,6	59,2
GR	81	33,3	76	100	64	70,9
GW	15	30	65	45	64,3	43,8
SF	36,4	38,6	50	53	63,9	48,4

The table displays the results of three tests of reading comprehension (loud reading) in relation with the teaching method. Genetic method by Rubínová was the most successful one at the end of the 1st class and during the 2nd year of primary school. Surprisingly, during partial testing of individual tests, this did not seem to be the case. This research indicates that there is an on-going process and it is not possible to determine clearly which method is the best. Every teacher prefers and goes down well with a different method. Also, pupils learn better or worse by a certain method depending on their abilities.

Most primary school teachers rely on the analytical-synthetic method for reading practice in the Czech Republic. This method was not proved to be the best from the perspective of reading comprehension of 2nd class pupils in our research. Pearson's correlation coefficient was not confirmed between the teaching method and reading comprehension.

7. Conclusion

We have tried to introduce briefly the reading methods used in the Czech Republic and to present the results of reading tests taken by students taught by these methods in Czech schools, focusing on reading comprehension. These results cannot establish a general conclusion. The findings are interesting and could help to show a direction in learning about elementary literacy and to choose an appropriate method of reading practice. We believe that our research will contribute to the development of early reading literacy. It is encouraging that some teachers already use more methods in one classroom according to individual pupils' needs and abilities.

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