

TREĆI MEĐUNARODNI SIMPOZIJ GLAZBENIH PEDAGOGA
THIRD INTERNATIONAL SYMPOSIUM OF MUSIC PEDAGOGUES

**Glazbena pedagogija u svjetlu
sadašnjih i budućih promjena – 3 –**

**Music Pedagogy in the Context
of Present and Future Changes – 3 –**

Tema simpozija/Topic of the Symposium:

Interdisciplinarni pristup glazbi: istraživanje, praksa i obrazovanje
Interdisciplinary Approach to Music: Research, Practice and Education

Organizator/Organized by:
Sveučilište Jurja Dobrića u Puli – Juraj Dobrića University in Pula
Odjel za glazbu – Department of Music
Odsjek za glazbenu pedagogiju – Music Pedagogy Section

ZBORNIK RADOVA S TREĆEG MEĐUNARODNOG SIMPOZIJ GLAZBENIH PEDAGOGA
PROCEEDINGS FROM THE THIRD INTERNATIONAL SYMPOSIUM OF MUSICAL PEDAGOGUES

Impressum**Izdavač/Publisher:**

Sveučilište Jurja Dobrile u Puli – Juraj Dobrila University in Pula
 Odjel za glazbu – Department of Music
 Zagrebačka 30, Pula

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Prijelom i tisak/Layout and press:

MPS tiskara

Naklada/Copies:

300

*Članci se referiraju u./Articles are referred to:

RILM (Répertoire International de Littérature Musicale)

CIP - Karologizacija u publikaciji
 Sveučilišna knjižnica u Puli

UDK 371.3:78>(063)

MEĐUNARODNI SIMPOZIJ GLAZBENIH PEDAGOGA (3; 2013; Pula) Glazbena pedagogija u svjetlu sadašnjih i budućih promjena 3: interdisciplinarni pristup glazbi: istraživanje, praksa i obrazovanje: zbornik radova s Trećeg međunarodnog simpozija glazbenih pedagoga, Pula, 18.-20. travnja 2013.

Music pedagogy in the context of present and future changes 3: interdisciplinary approach to music: research, practice and education : proceedings from the Third international symposium of musical pedagogues, Pula, 18th-20th April 2013 / <urednica Sabina Vidulin-Orbanić>. – Pula: Sveučilište Jurja Dobrile u Puli, Odjel za glazbu, 2013.

Bibliografija iz svakog rada; bibliografske bilješke uz tekst. - Summaries.

ISBN 978-953-7498-65-8

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Musical motivation in early reading and writing of the Croatian language

UDK 811.163.42:372.4>:78

Izvorni znanstveni rad (Original research paper)

Abstract

Interdisciplinary research in the field of music and in the field of early reading and writing (Fisher and McDonald, 2001, Butzlaff, 2000, Gromko, 2005, Forgeard et al, 2008, Moritz et al. 2012) confirm that intensive and active musical activity concurrent with early language/mother tongue teaching influences the development of phonological awareness, enhances rhythm skills and improves cognitive abilities. The research of the processes of early reading and writing (Bežen 2011, Budinski and Kolar Billege 2012) produces methodological standards, systems and methods in the teaching of early reading and writing. Based on these neuroscientific/neurolinguistic findings, contemporary methods of teaching early reading and writing in the mother tongue take account of all human senses included in the process of phonological acquisition, as well as the acquisition of letters, reading and writing. Patel's "OPERA hypothesis" 2011 (Overlap-Precision-Emotion-Repetition-Attention), which includes overlapping of the neural networks in the speech and music processing centres, music pacing higher demands on these shared networks than does speech, in terms of the precision of processing, positive emotions elicited by music activity, repetitiveness in music which strengthens neural networks and focuses attention demanded by the perception of music itself, gave us the incentive to incorporate a pronounced auditive element in the musical motivation segment of the capital and lower-case letter teaching (monograph approach) in the existing method of early learning of reading and writing a mother tongue. The goal of the research was to collect initial data on the phonological awareness and the influence of music in the musical motivation segment of the capital and lower-case letter teaching. The research problems encompass recording of differences in the initial phonological awareness, influence of music onto sound-letter association and graphic formulation of letters in both, experimental and control group. The initial hypothesis is that teaching early reading and writing employing musical motivation is statistically more successful than traditional teaching methodology (experimental and control group). The results of the research are based on the normalities of distribution of measured variables using

a Kolmogorov-Smirnov test; there are no deviations from the normal Gauss distribution. Based on the thus obtained data on the initial state of phonological awareness, musical motivation is introduced in the introductory segment of the Croatian language class (early reading and writing). Students learn a song saturated with a sound to be learned. Concurrently, the song serves as a motivation as its lyrics describe the graphic image of the letter, provide the words and contexts used in the textbook, and its harmonious and simple melody has an emotional impact on students motivating them to learn both, the sound and the graphic image of the letter. Singing, students learn kinaesthetically as they move to illustrate the song. This methodical procedure and the implementation of the process itself combine the synergy theories in methodology (Bežen 2011) of early reading and writing, and the interdisciplinary (visual, auditive and kinaesthetic) approach to teaching.

Key words: early reading and writing, interdisciplinary approach to teaching, musical motivation, phonological awareness.

Introduction

Definition of terms

The original meaning of the word motivation in the Croatian language is the explanation of motifs in a work of literature. Alternatively, (psych.) it refers to incentives which move one to act, and which define the direction, intensity and duration of that action (HER, 765).¹ In the methodology of early literacy teaching motivation is defined as “a state wherein certain needs, desires and motives move us to achieve a goal.” This goal is an external incentive to act. Thus motivation is likened to learning, because learning too, brings about a change of behaviour. “Motivation can be likened to emotions, as well; and therefore certain psychologists believe that motivation (a state of being motivated) is equivalent to an emotional state” (Bežen, 2008, 123). Bežen points out that as of recently the term motivation is being replaced by the terms will, aspiration, desire, need, inclination or wish. Motivating students is the main task of contemporary teaching methodology as it is related to interests and motives which contribute to the success of the teaching process, namely, to the success of both, teaching and learning. Early literacy teaching methodology differentiates a series of motivation procedures which trigger intellectual and emotional activities in students in individual teaching segments. Early literacy teaching methodology sees motivation as the most important segment to be dealt with at the beginning of a class, as it is on the initial motivation of students that the success of the teacher’s methodological procedure depends.

Early literacy is a specific area of Croatian language teaching since it cannot be fully incorporated into other areas (language, literature, and expression or media culture). Its specificity is the acquisition of knowledge, skills and abilities (Bežen, 2002, 2007) which form a prerequisite for future functional and creative engagement with language and literature in order to acquire linguistic, communication, literary and media literacy.

Basic sciences of importance for early reading and writing are: linguistics, psychology, psycholinguistics, visual arts and graphemics. Fundamental disciplines of importance for early

¹ Translations of the Croatian originals were made for the purposes of this article.

literacy teaching methodology, and correlational disciplines (music) which in practice enable relation and explanation of terms, as well as auxiliary disciplines which assist in the analysis and interpretation of the segments of basic sciences participate in the realisation and methodological articulation of early literacy in an actual teaching situation.

According to Budinski and Kolar Billege (2012), discerning sounds in a word, that is, phonological awareness is the most important skill for early reading. It is critical to be aware of each sound in a word, and to be able to put them together in the right order.

As a correlational discipline in early literacy teaching practice, music connects the content of basic sciences with articulation and acoustics, as well as with the graphic image of a letter (graphemics).

For the purposes of this paper musical motivation has been included as a methodological tool in early reading and writing teaching because of their interdisciplinary nature. In the designated period (Bežen, 2011) students are taught the symbolism of letters, sounds and words, they acquire graphomotor and articulation skills, graphic competencies, and they learn to cope in the field of writing.

Numerous researches conducted all over the world reveal a relationship between reading with understanding and music (Butzlaff, 2000). Gromko (2005) found a relationship between musical education and phonological awareness of early readers. Forgeard et al (2008) have confirmed that there is a firm link between musical competence and speaking skills. Fischer and McDonald (2011) have confirmed that musical activity enhances reading ability even prior to formal in-school education.

Musical motivation

Previous research and methodical literature in Croatia implement music in the teaching methodology of literary texts only (motivation with music teaching segment). Šabić (1990, 82) defined musical motivation as assistance in the reception and interpretation of a lyrical poem and defines it as an act "with multiple methodological, that is literary and communicational, motivation." Musical motivation according to Rosandić (2005) paves the way for deep experience and mood creation. A principle of correlation is realised by incorporating musical compositions in the teaching practice; thereby methodological tools contribute to aesthetical education.

Hrvatski enciklopedijski rječnik (HER, *Croatian Encyclopaedic Dictionary*) defines music (Greek *mousikê*) as "the art of expressing oneself in tones, sounds and noises, while *Muzička enciklopedija* (Musical Encyclopaedia) defines it as "artistic discipline whose material is sound (ME 1974, 656)." Basic elements of music are tone, rhythm (which includes tempo, meter and articulation), dynamics, and sound characteristics such as timbre and fullness. Music is immanent to human beings, just as speech is, and is closely related to verbal expression. Archaeological findings of different musical instruments of ancient cultures testify to man's need to make music, of his need of acoustic expression. The study of ancient cultures traces the development of musical thought in magic rituals (Andreis, 1975, 11) which, in addition to sand drawings, bone fires and dancing, include singing as well (Andreis, 1975, 11). "Awareness

that he can produce tones unlike any produced by other beings around him, gave the primitive man the strength and faith in the far-reaching impact of those tones" (Andreis 1975, 11). A large extent of musical creation of all nations rests on the association of words and tones. According to Andreis (1975, 12) "In the magic ritual manual there is often a close association of tones, words, movements and mimics in the service of an action..." It is interesting to note that many languages use the same word to denote both, "poetry" (Dichtung) and "singing" (Gesang).

Harnoncourt (1988, 19) points out that "at the moment when language reaches a profundity surpassing that of any concrete message, it is immediately linked to a song, because with the help of song anything over and above pure information can be conveyed more clearly... Thus the spoken word, the meaning of words, can be intensified by tones, melodies and harmonies, which make it possible to reach a kind of understanding that goes beyond the purely linguistic." From the ancient times, development of rhetoric and poetry connects the elements shared by music and speech: intonation, meter, rhythm, accentuation. Music and speech are closely connected, and speech is, by the very nature of human development, connected with writing, reading and understanding of a written text. In early learning and teaching students transpose spoken into written language. In the scientific study of human development, it seems logical to link music to the speech process, which is in the learning process conveyed through the recognition and writing of signs (letters), and by reading them and connecting them into a meaningful whole. Therefore the following question needs to be posed: can music, which is immanent to man, provide assistance in the early literacy phase?

Music is pre-eminent among the arts because of its order and clarity, the sharply defined character, of its element. Kalkavage also points out that music evokes overpowering emotions. It does so through well-defined structures, through an order of tones and rhythms. For Kalkavage music is the union of the rational and irrational, of order and feeling (Kalkavage, 2006). The primary effect of music is visible in the affective area. According to Breitenfeld and Vrbančić (2011, 62) many reactions to music are not physiological, rather, they are emotional. It is considered that they are controlled by *amygdala* (ganglia in the brain in charge of emotions). It receives input directly from the *thalamus*, before it is processed by the *cortex*, the conscious part of the brain. Information about music which we receive from the cortex is cognitively more complete; however, they are not received as quickly as *amygdala* receives them. Music has a quicker impact on emotions, and they in turn trigger motivation. Thus, music has an important role in early literacy.

Overview of early literacy and music research

Forgeard et al (2008, 383) point to the relationship between music and acquisition of literacy and claim "that in normal-reading children (without dyslexia) phonological and reading skills were predicted by musical discrimination. These relationships were stronger in children with music training than in control children without music training." Forgeard et al (2008, 384) also point out that singing children's songs helps in segmenting words into syllables. According to Bolduc-Lefebvre (2012, 495) nursery rhymes, songs and listening activities help preschoolers take the first steps towards being competent readers. The authors proved the efficiency of

supplementing linguistic activities with nursery rhymes in the development of early literacy skills, and point out that additional musical activities enhance phonological awareness. Active engagement with music and sound articulation (Gromko, 2005) facilitates sound analysis and synthesis of words.

Moritz et al (2012) proved early rhythmic skills, music training and phonological awareness in preschoolers (children aged 5-6) to be connected. They also claim that reading is one of the most important and complex academic skills to be acquired by students; its formal instruction usually begins in the first grade. Many American educators and researchers have looked to use the pre-reading years to prepare children better for requirements of reading acquisition which is necessary for further education.

The incentive for this research comes from the scientific hypothesis of A. Patel (2011) titled "The OPERA Hypothesis." For Patel evidence which goes to prove that "musical training benefits the neural encoding of speech are the following: (1) **O**verlap - there is anatomical overlap in the brain networks that process an acoustic feature used in both music and speech (e.g., waveform periodicity, amplitude envelope), (2) **P**recision: music places higher demands on these shared networks than speech does, in terms of the precision of processing, (3) **E**motion: the musical activities that engage this network elicit strong positive emotion, (4) **R**epetition: the musical activities that engage this network are frequently repeated, and (5) **A**ttention: the musical activities that engage this network are associated with focused attention." Motivated by Patel's hypothesis which stresses firm relationship between neural encoding of music and speech, and which comprises five conditions in the support of this hypothesis, we have decided to incorporate a pronounced auditory element in the musical motivation segment of the capital and lower-case letter teaching (monograph approach) in the existing method of early literacy teaching in the mother tongue.

Use of music in teaching was a topic of interest for many international as well as Croatian researchers who always stress the relationship between music and subjects not directly related to it.

Fisher (2011) states that an increasing number of researchers use music in class to teach language. He also stresses the importance of the method and the procedures whereby music is incorporated in the early literacy teaching.

Douglas and Willatts (1994) recognized the relationship between rhythmic skills and reading in seven- and eight-year-old children. Stein (2008) pointed to the fact that music and movement develop listening and motor skills, linguistic and problem solving ability, literacy, critical listening skills, and communication. Music improves emotional stability, cooperativeness and empathy. Stein also claims that there is a correlation between music and development of reading skills. Jensen (2003) replied with an enthusiastic yes to the question whether or not music belongs in class when the subject taught is not music.

In Croatia, in *Metodičke upute za početno čitanje i pisanje slova* (Methodological Instructions for Early Literacy Teaching) (Šabić et al, 2004) in the chapter on basic class structure, the authors list a series of motivational exercises, and, alongside with language games (incorporating both, analysis and synthesis) and onomatopoeic games, they also mention listening to music as a motivational element in the introductory segment of the class.

Šulentić Begić and Špoljarić (2011, 449) point out that “the reason for the introduction of musical activities in other classes could be the opinion that music develops not only music abilities, but it also assists in the development of intellectual (conclusion, analysis, memory, abstraction, understanding) and motor (speed, coordination, precision) skills.”

It should be pointed out that Croatian literature on teaching methodology after the Second World War devoted significant attention to the early literacy teaching according to the analytic and synthetic method. *Priručnik za rad s početnicom (bukvarom)* (Handbook for the Use of the Spelling Book) published in 1946 recommends the use of riddles and putting of poems to music in order to practice certain sounds (Cvitan, 1946, 17-19). *Priručnik* holds musical scores and examples of songs for individual sounds /letters.

Based on previous research, in Croatia and internationally, for the purpose of this paper we have included musical motivation in the methodological tools for early literacy teaching.

Research methodology

Research procedure

The research was conducted on an appropriate sample. The respondents were first grade students. A number of N=31 students participated in the research (experimental group 16, control group 15 students). The research was conducted in the period from November 2012 to January 2013 in the 1a and 1c class of the Ivan Goran Kovačić Elementary School in Zagreb.

Methodological tools accompanied teaching segments and learning situations of lower case and upper case letter (monograph approach). Music was incorporated in the first teaching segment (Motivation). Following the introductory motivational story for each sound/letter a poem comprising a few stanzas was put to music. The lyrics of the song are saturated with the sound to be learned and accompany the motivational story the teacher read at the beginning of the class. The first and the last stanza describe the graphic image of the letter. Having in mind the complexity of the task the students need to accomplish in one language class (memorize both, words and melody), when putting a poem to music, special attention was devoted to the simplicity of the melody which needs to be within the singing voice span of children (h-dl), and to the simple rhythmical pattern which needs to be in accordance with the nature of Croatian accentuation so as not to disrupt correct accentuation of the words to be learned. In the course of the research the author of both, text and music (Tamara Jurkić Sviben, 2012), musically motivated the experimental group by singing a song accompanying herself on keyboard. Following this activity there was a pause to process the impression. The students were then asked to verbalize their impression which was expressed with any of the following contentions: “I like it!”, “It is so tender!”, “This song was so joyful!”, “It is interesting!”, “It is rough!”, “The song is sad!”, “This song was swingy! (*sic*)” (emotional acceptance of a song as part of the motivational act). Following the articulation of their impression which lasted ninety seconds, the author read the song verse by verse, and the students repeated each verse out loud. Next, with the assistance of the author, the students learned the rhythm, melody and the lyrics of the song by rote; the author singing, the students joining in by following the score in the textbook. In the second repetition kinaesthetic movement accompanied the stanza describing

the image of a letter. The students moved around to show how a letter is to be written (graphic components of a letter) following the instructions given in the lyrics. Transposition of sound into letter and the writing of a grapheme were performed in a series of teaching segments and situations. At the end of the class, in the creative work segment, the students sang the song with the author for the last (third) time. We have observed exceptional interest for learning upper case and lower case letters. In the period from the beginning of November until the middle of January we have taught twenty sounds and letters employing this method. In the control group, music was not used in the teaching methodology of upper and lower case letters.

KOSOV KLJUN



1. Na je - dnu rav - nu cr - tu do - dam ko - sov kljun,
2. I kap - nem ma - lo ki - še i kra - stav - ca dva,
ko - ka, ku - pus, krum - pir, kot - lić mi je pun.
ja - bu - ko - vim so - kom sve za - ključ - kam ja.

Example 1. Blackbird's beak (Text and music by Tamara Jurkić Sviben, 2012)

BAKA

1. Ba - ka se pu - nog tr - buš - či - ća lju - lja, bi - je - lim je snije - gom pri -
 2. ba - ki - nom bo - rav - ku Bo - žić već bli - sta, bom - bo - na i ja - bu - ka
 3. B ka - o ba - ka, ba - lon i - li bu - ha, cr - ta sam rav - na ja
 4. B slo - vo ma - lo u zu - bu me i - ma, ši - ba me tre - ba, al'

do - šla o - lu - ja. Bo - žić je bli - zu i so - bo - vi ju - re,
 na bo - ru tri - sta. Bi - ba i Bu - bi uz va - tri - cu sje - de,
 sa dva tr - bu - ha. Je - dan je ma - nji, a dru - gi je ve - ći,
 ne - ma me zi - ma. Na cr - ti - cu rav - nu tr - buš - čić o - kru - ži,

1. bli - sta - vi da - ro - vi pod bor nam žu - re. pod bor nam žu - re. U
 ko - la - će mi - ris - ne Bi - ba već je - de. Bi - ba već je - de.
 bu - di - mo za - je - dno u dob - roj sre - ći. u dob - roj sre - ći.
 B slo - vu ve - li - kom ti me pri - dru - ži! Na ti me pri - dru - ži!

Example 2. *Grandmother* (Text by Tamara Jurkić Sviben (2012) and Saša Veronek Germadnik (2008), music by Tamara Jurkić Sviben, 2012)

Results of the research

For the purposes of the research, experimental and control group were made statistically equivalent. Comparability of groups was checked with a questionnaire the parents filled out (authors: Butković, A. and Jurkić Sviben, T. 2012), and with the initial phonological awareness test (authors: Budinski, V. and Kolar Billege, M. 2012) conducted in September 2012.

Namely, before we researched the influence of music on the success in solving phonological awareness test, we wanted to establish whether there is a difference between the control and experimental group in certain characteristics we deemed relevant for the research (group comparability check).

Chi square test shows that there is no statistically significant difference in any of the relevant variables between the two groups of students. The results are given in the Table 1 below.

Variable	Percentage of correct answers in the initial test		Results of the chi square test (df=1)
	E	K	
1 Segmenting sentences into words	93.8%	86.7%	$\chi^2=0.44$; $p>0.01$
2 Segmenting words into syllables	87.5%	73.3%	$\chi^2=1.00$; $p>0.01$
3 Detecting the first phoneme/sound in a word	100.0%	86.7%	$\chi^2=2.28$; $p>0.01$
4 Detecting all phonemes/sounds in a word	100.0%	86.7%	$\chi^2=2.28$; $p>0.01$
5 Connecting phonemes/sounds in a word	87.5%	93.3%	$\chi^2=0.30$; $p>0.01$
6 Erasing phonemes/sounds	50.0%	26.7%	$\chi^2=1.78$; $p>0.01$
7 Adding phonemes/sounds (recognition)	56.3%	33.3%	$\chi^2=1.64$; $p>0.01$
8 Adding phonemes /sounds (insertion)	12.5%	25.7%	$\chi^2=1.00$; $p>0.01$
Variable	Percentage of „Yes“ replies by the parents		Results of the chi square test (df=1)
	E	K	
1 Reading all letters before elementary school	50.0%	66.7%	$\chi^2=0.88$; $p>0.01$
2 Writing all letters before elementary school	50.0%	60.0%	$\chi^2=0.31$; $p>0.01$
3 Kindergarten attendance	100.0%	93.3%	$\chi^2=1.10$; $p>0.01$
4 Choir attendance before elementary school	18.8%	6.7%	$\chi^2=1.00$; $p>0.01$
5 Music kindergarten or solfeggio before elementary school	0.0%	13.3%	$\chi^2=2.28$; $p>0.01$
6 Currently attends music school	12.5%	6.7%	$\chi^2=0.30$; $p>0.01$
7 Currently attends rhythmic, ballet or dancing classes	25.0%	26.7%	$\chi^2=0.01$; $p>0.01$
10 Child tells stories	81.3%	80.0%	$\chi^2=0.01$; $p>0.01$
11 Child sings in everyday situations	87.7%	80.0%	$\chi^2=0.32$; $p>0.01$

Table 1. Results of the chi square test for the assessment of initial difference between relevant characteristics of students in the experimental and the control group

Legend: E – experimental group, K – control group, χ^2 - chi square test, df – degrees of freedom, p – probability of error

We have additionally checked and consequently proved that there are no differences between the two groups according to age ($\chi^2=1.00$; $df=1$; $p>0.01$), gender ($\chi^2=0.33$; $df=1$; $p>0.01$), frequency of parents' story reading to a child ($\chi^2=1.02$; $df=3$; $p>0.01$), frequency of parents' storytelling to a child ($\chi^2=1.47$; $df=3$; $p>0.01$), frequency of parents singing to a child ($\chi^2=5.04$; $df=4$; $p>0.01$), and frequency of joint parent-child concert attendance ($\chi^2=5.45$; $df=4$; $p>0.01$).

Since it has been determined that there are no significant statistical differences between the experimental and the control group in any of the relevant variables, we have processed data

relating to success in certain tasks between the experimental and control group following the introduction and implementation of musical motivation in the experimental group. The results of the initial test conducted by Budinski and Kolar Billege at the Faculty of Teacher Education, University of Zagreb, in September 2012 (beginning of school year) reveal lower success rate in the erasing of sounds/phonemes segment. Results following the introduction of musical motivation are given in Table 2 below.

Variable	Percentage of correct answers		Results of the chi square test (df=1)
	E	K	
6 Erasing of phonemes/sounds	68,8%	66,7%	$\chi^2=0.15$; $p>0.01$
7 Adding phonemes/sounds (recognition)	56,3%	53,3%	$\chi^2=0.03$; $p>0.01$
8 Adding phonemes/sounds (insertion)	62,5%	33,3%	$\chi^2=2.64$; $p>0.01$
9 Substitution of sounds/phonemes	75,0%	40,0%	$\chi^2=3.89$; $p<0.05$
10 Speech	100,0%	100,0%	$\chi^2=0.00$; $p>0.01$
11 Writing: <i>miš</i> (mouse)	100,0%	93,3%	$\chi^2=1.10$; $p>0.01$
12 Writing: <i>pas</i> (dog)	87,5%	93,3%	$\chi^2=0.30$; $p>0.01$
13 Writing: <i>medved/medo</i> (bear)	68,8%	73,3%	$\chi^2=0.08$; $p>0.01$
14 Writing: <i>žaba</i> (frog)	81,3%	86,7%	$\chi^2=0.17$; $p>0.01$
15 Writing: <i>olovka</i> (pencil)	50,0%	53,3%	$\chi^2=0.03$; $p>0.01$
16 Writing: <i>sladoled</i> (ice cream)	75,0%	66,7%	$\chi^2=0.26$; $p>0.01$

Table 2 Results of the chi square test for the assessment of difference in achievement of different tasks between relevant characteristics of students in the experimental and control group

Legend: E- experimental group, K – control group, χ^2 - chi square test, df – degrees of freedom, p – probability of error, **bold letters** – statistically important difference

According to Table 2 above there is a statistically significant difference between the two groups of students. It is the result of the substitution of sounds/phonemes test ($\chi^2=3.89$; $df=1$; $p<0.05$). Results speak in favour of the experimental group which had musical motivation introduced. The success rate of the experimental group in the substitution of sounds/phonemes task was 75%, while that of the control group was only 40%. The results are given in the Figure 1 below.

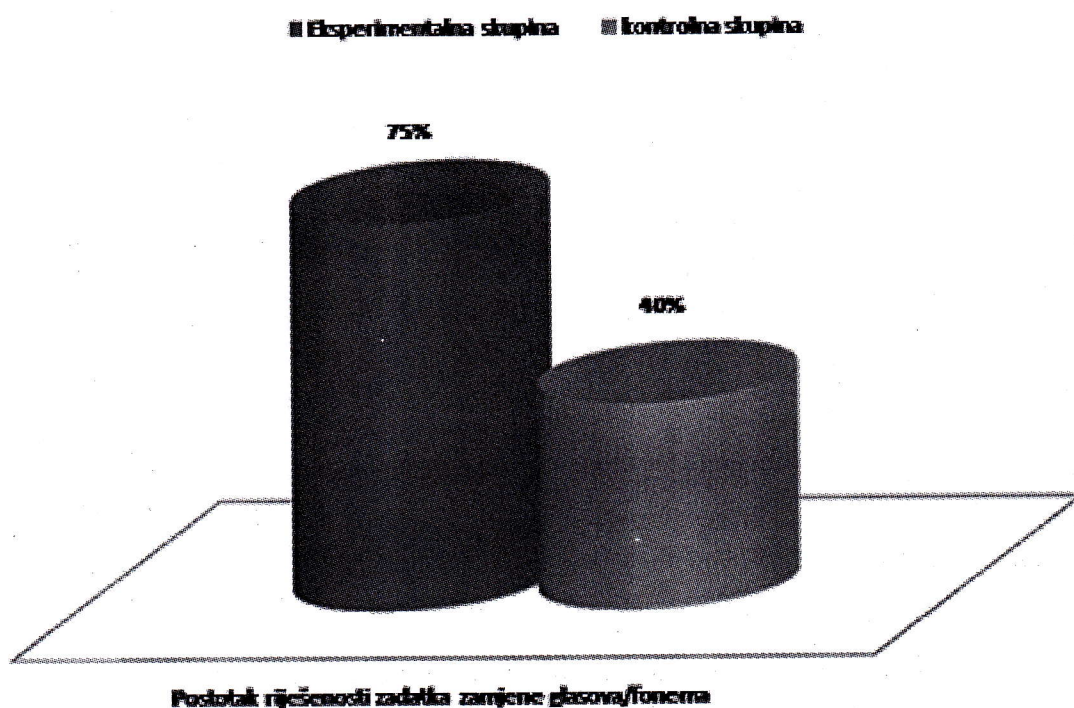


Figure 1. Success rate of students from the experimental and control group in the substitution of sounds/phonemes test

In addition to the above, we have calculated the total score for all 11 tasks for each individual student, and have tested the normality of distribution of the test results. The results were tested with Kolmogorov Smirnov test which revealed that the total result in the test follows normal distribution of results ($Z=0,89$; $N=31$; $p>0,01$). Next we ran a t-test for independent samples to check if there is a difference between the experimental and the control group in the total test result. The t-test obtained ($t=-0,75$; $df=29$, $p>0,01$) revealed that there is no difference in the total test result between the experimental and the control group.

Conclusion

Results have shown that there was a statistically significant difference in the experimental group following the introduction of musical motivation. It is evident in the score of the substitution of sounds/phonemes test ($\chi^2=3.89$; $df=1$; $p<0.05$). Results speak in favour of the experimental group which had musical motivation introduced. The success rate of the experimental group in the substitution of sounds/phonemes task was 75%, while that of the control group was only 40%. Great statistical significance points to the need for further research related to incorporation of music among the methodological tools for the teaching of lower and upper case letters (phonological awareness, transposition of sound into letter and graphic image of a letter). Practical implications should be directed towards the choice of appropriate music which would encourage pre-reading and reading skills acquisition.

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