Croatian Journal of Education
Vol.22; No.1/2020, pages: 41-76
Original research paper
Paper submitted: 12th June 2018
Paper accepted: 28th January 2019
https://doi.org/10.15516/cje.v22i1.3258

An Empirical Verification of the Integral Development Method for Deaf Children

Gordana Nikolić[1], Vesna Radoman[2] and Sanja Dimoski[2]
[1]*University of Novi Sad, Faculty of Education in Sombor*
[2]*University of Belgrade, Faculty of Special Education and Rehabilitation*

Abstract

Empirical findings on the difficulties deaf children face in certain areas of cognitive, conative, emotional, and social development served as a basis for the Integral Development Method for Deaf Children. The principles of the World Federation of the Deaf (WFD) relating to the importance of sign language, neglected for a long time, provided a wider basis of this method. The first part of the article presents the method in a general way. The research part of the article examined the results of two experimentally controlled workshops. The first workshop examined the effects of various non-verbal stimulation techniques on cognitive development. The second workshop examined the effects of a systematic application of sign language on communicative and educative development. Data in Study 1 were collected by Piaget's test and in Study 2 by the Communication Competence Scale. The sample consisted of 50 subjects in Study 1 and 60 subjects in Study 2. The subjects were deaf children aged 8 to 12. The results confirmed that a systematic application of various non-verbal workshop techniques that are suitable for deaf children significantly contributes to the promotion of cognitive development and that they effectively enhance and accelerate the concrete operational stage. A systematic application of Serbian sign language influenced the promotion of Serbian speech-language and complete communicative competence, as well as higher cohesion of sign language and speech-language communication skills. Sign language also influenced school achievement.

Keywords: *cognitive development; communication; non-verbal approaches; sign language*

Introduction

Different developmental approaches used in work with deaf and hard-of-hearing children resulted in a great number of frequently contradictory rehabilitation and education programmes that have been evolving since the middle of the 18th century until today (Radoman & Nikolić, 2013). The spirit of the Enlightenment and new ideas of work with deaf children were initiated by Charles-Michel de l'Épée (1712 – 1789) and his follower Ambroise Cuccuron Sicard (1742-1822), who recognized sign language as a key component of work with deaf children (Lane, 1984).

From a historical perspective, the theoretical approach advocated by Lev Vygotsky (1996), who laid the foundation for much later developed social inclusion and inclusive education, enabled a shift of the focus from a disorder and incapability to intact capacities of deaf children and paved the way for the social model of disability.

Piaget's theory of cognitive development was also one of the sources of surdopsychology, particularly for Hans Furth (1966; 1971), who elaborated on Piaget's view of non-linguistic roots of intelligence and possibilities for the unhindered intellectual development of deaf children despite their language incapacity. Real and visible changes in work with deaf children first started in the United States of America and then in Europe, when many special schools introduced programmes and procedures including sign language (SL) – as a language that is considered the true verbal language – as well as a wide range of non-verbal models of stimulation of deaf children's development (Klima & Bellugi, 1979). Numerous studies of sign language were initiated later on (De Clerck, 2007; Gregory, Knight, McCracken, Powers & Watson, 1999; Johnson, Liddell & Erting, 1989; Radoman & Nikolić, 2013; Quer & Muller de Quadros, 2015).

For over twenty-five years in some countries, and more recently in others, bilingual education involving sign language and the written/spoken vernacular has been considered an essential educational intervention for deaf children (Knoors & Marschark, 2012). Revisiting language planning and policy in deaf education will require a reconsideration of the place that sign language holds in the raising and education of deaf children. Importantly, this is not a question of whether natural sign languages such as American Sign Language (ASL) and Sign Language of the Netherlands (SLN) are full languages, or whether there is a deaf community for which sign language is an identifying feature and a primary medium of communication, or whether sign language and deaf culture are the essential pillars of the deaf community, or even whether growing up with sign language and deaf culture can be valuable for deaf children (Albrecht et.al., 2006). It's important to note that a lot of literature in this field is grounded in the traditions of oral or speech approach, which have shaped ideological practices of language planners, policy makers, educators of the deaf, and even deaf people themselves. It was not until the first signs of ''increased international contact with politically empowered deaf people and the rapidly changing consciousness in deaf communities"(De Clerck, 2007), which also have a better understanding of the dimension of SL, at least in those countries that systematically support their national SL. Also, unfortunately, the quality

and accessibility of SL courses and supporting material (dictionaries, grammar books, textbooks, etc.) are below the actual need. At the same time, these lexicographic works pretend to fulfil the function of reference dictionaries, but those dictionaries involve sign language only in the form of drawings and/or photos representing meanings of different signs. A major feature of such dictionaries is the absence of definitions, it being assumed that each sign would have the same meaning(s) as the written word with which it is linked (Irvine & Gal, 2000). This sort of production treats signs as equivalents of the words of a spoken language and neglects the complexity, the dignity of sign language and its peculiarities in semantics and syntax (Kusters, 2014).

When we talk of the situation of deaf children in Serbia, the "deification of speech" (Lane, 1984, p. 101) has been so typical of deaf education that one only needs to look at the plethora of Serbian studies on deafness and hearing loss (e.g. Savić, 1986; Dimić, 2003; Nikolić, Ostojić & Mirić 2014) that focus mainly on rehabilitation practices aimed at teaching deaf people to speak. Namely, those circumstances of research and educational practice in Serbia have inspired a more complex approach to the theme incorporated in the Integral Development Method for Deaf Children (IDMDC).

The Integral Development Method for Deaf Children, generally

The Integral Development Method for Deaf Children (IDMDC) was developed and implemented in the Centre for the Integral Development of Deaf Children in Belgrade at the end of the 1990s (Radoman & Nikolić, 2000a; 2000b; 2013) to stimulate and advance the developmental areas where deaf children face difficulties.

The Integral Development Method is an eclectic blend of contemporary theoretical findings and experiences acquired in practical non-traditional approaches to deaf children. It is based on Jean Piaget's theory of cognitive development (Phillips, 1969; Piaget, 1968; Piaget & Inhelder, 1986), Hans Furth's papers (1966; 1971), Lev Vygotsky's cultural-historical theory (1996), Hans Cassirer's philosophy of symbolical forms (1978) and humanistic and existential personality theories. It is also founded on the results of the psychology of deafness (Levine, 1981; Marschark, 1993; Živković, 1996; Radoman, 2005; Radoman & Nikolić, 2013) that point out the developmental areas where deaf children face difficulties (conservation, abstract thinking, insufficient creativity, weak motivation, low self-esteem, etc.) and those developmental areas that are adequately or highly developed (detailed visual perception, ability to remember movements, certain aspects of non-verbal intelligence, etc.) as well as the results about the importance of sign language and bilingual approaches for the cognitive and communicational development of those children (Bench,1993).

The IDMDC stimulates relevant developmental areas such as cognitive, linguistic, communicational, educational, creative, emotional-social, and conative development (Radoman & Nikolić, 2000b; Nikolić, 2009; Radoman & Nikolić, 2013). Stimulation of these developmental aspects is achieved through group work and workshops involving sign language, play, movement, dramatization, laughter, interesting tasks and group

problem situations. Work with deaf children takes place in cognitive, communicational, creative, and drama workshops, while work with parents and wider social environment is carried out in a workshop for parents and in a public opinion workshop in line with the social model of disability that focuses on removing social barriers and modelling the environment in accordance to all kinds of disabilities (Radoman, 2011; Radoman, & Nikolić, 2013).

Cognitive development is achieved by games and tasks based on Piaget's principles and implying mental operations such as classification, permutation, conservation, etc. Verbal as well as non-verbal models are used in some workshops for notion formation and abstract thinking. Verbal models that include signs, writing and reading are used for developing certain phases of notion formation based on Vygotsky's theory.

Communicational development is stimulated through the instruction of Serbian sign language, dactylology, bilingual methods (both oral and sign), and a total communication method that includes all communication forms – signs, drawings, lip-reading, speaking and writing (Stokoe, 2005; Reagan, 2010). Petar Guberina's (1972, 2010) verbotonal method was used primarily as an approach that takes care of the suprasegmental characteristics of the development of oral speech such as intonation, dynamics, tempo, music and gesture as an aspect of motoric control of speech (Dulčić, 2018). That approach was taken as a basis of acquisition of sign language. This means that sign language acquisition within our communicational workshop was accompanied by natural supports of communication comprehension such as gesture, facial expression, and space (as a form of the prosodic platform of sign language). A wider framework of the Integral Development Method was provided by the World Federation of the Deaf's principles relating to the importance of Serbian sign language (that has been long neglected and even forbidden for deaf children). They recommend to apply sign language respecting the culture and identity of deaf people and to implement bilingual education and life-long education in sign and oral language for the deaf (Timmermans, 2005).

The Integral Development Method relies on a developed practice of using elements of art activities (drama, painting, drawing, dance movement, and opening the Theatre for deaf children) in work with deaf children.

The results of relevant studies pointed out that expressive elements of art activities can positively influence different aspects of psychosocial functioning (Miholić & Martinec, 2013).

Creative development is stimulated through play, dance, drawing, ceramic art, tailoring, and sewing. For example, in the drama workshop, children take part in drama theatre, pantomime, dance, musical vibrotactile reception, etc. By identifying with drama characters and characters from real life, children dramatize certain situations from their school and family life and may as well give theatre topics themselves. In this manner, children get to know themselves and their environment better and the effects of these activities are not only creative because the children also develop their

social skills. We need to point out that we have not used all modalities of the IDMDC in our studies, but only the influence of non-verbal stimulations (Study 1) and the influence of Serbian sign language (Study 2).

Research

The empirical research addressed in this paper was conducted in two parts – two different studies that included only segments of the IDMDC in the form of cognitive non-verbal stimulations (Study 1) and sign language (Study 2). The studies were carried out in the two schools for deaf children, "Stefan Dečanski" in Belgrade and "Radivoj Popović" in Zemun and were organized by the Centre for Integral Development of Deaf Children. The aims of the research were: 1 to test the efficiency of systematically applied non-verbal forms of work and their effect on cognitive development; 2 to test the efficiency of sign language and their effect on communication and education of deaf children. The studies were conducted during five-month work that took place in one cognitive workshop and one communication workshop. The workshops were facilitated by the instructors specially trained for implementation of the method. The instructors had been trained by the authors of the method and the training implied theoretical knowledge and practical skills necessary for adequate workshop facilitation. The instructors were not familiar with the expected outcomes of the workshops so that the authors of the method – researchers – constantly monitored the implementation of activities. Different groups of children took part in each study, i.e. the children who took part in the first study did not take part in the second one. The studies were carried out separately with a two-year break in between. During the research, all potential participants were tested and the examinees were divided into a control group and an experimental group. After the initial testing, the examinees were grouped based on test results, age, gender and degree of hearing loss. The uniformity of the groups was statistically confirmed afterwards. During the research, the members of the control group were not familiar with the workshops realized mainly in another school in the afternoon hours after the lessons.

The scientific and research scheme applied in both studies represents an experiment with parallel groups. The research made use of only two techniques of the Integral Developmental Method: the technique of non-verbal stimulation of cognitive development (Study 1) and the technique of systematic application of sign language (Study 2).

Instruments

The first study used Piaget's cognitive abilities test (Study 1) and the second study (Study 2) used the Communication Competence Scale (CCS). The Hisky Nebraska test and the REVISK (the non-verbal scale) were used for the initial matching of the control and experimental groups. The matching instruments were obtained from the psychological service of the respective schools, while the testing was carried out by the psychologists, co-authors of this paper. The testing itself was carried out in the premises

of the school's psychological service. To test the influence of selected variables, Study 1 made use of the instruments from Phillips (1966), who described the assessment of non-verbal cognitive abilities according to Piaget, while Study 2 made use of the CCS that the authors of this paper had constructed and whose description will soon be given. The tests were administered individually for an average duration of 60 minutes. Instructions were given by the examiners through a combined standardized technique of using parallel oral and sign-based guidelines, and partly by written instructions.

Piaget's cognitive abilities test (Study1)

According to Piaget, the concrete operational stage, dealt with in this test, occurs between the ages 7 to 11. The test determines whether a respondent passed from the preoperational stage to the operational stage and whether a child mastered all cognitive components characteristic of the operational stage (test score 90 %-100 %) and therefore is ready to enter the formal operational stage.

Piaget's cognitive test consists of six subtests: 1 Matrix classification (containing two tasks), 2 Conservation of weight (containing five tasks), 3 Conservation of volume (containing five tasks), 4 Horizontal concepts (containing seven tasks), 5 Probability (containing ten tasks) and 6 Ordinal relations (containing two tasks). Each subtest has seven levels of assessment, and the maximum number of points is thirty-two.

Communication Competence Scale (Study 2)

The Communication Competence Scale (CCS) designed by Radoman and Nikolić (2000a) is an instrument for assessing the developmental level of global communication abilities in deaf children. The Scale tests total or global communication abilities through three dimensions.

The first dimension tests verbal communication abilities and contains two subscales with standardized tasks. The first one tests the abilities of speech, writing, and reading. The second one tests the abilities to communicate in sign language. The two united scales finally form a quantitative score, i.e. the total or global communicative abilities of the deaf child.

The second dimension includes one receptive and one expressive level. It contains four subscales. The first one tests the receptive abilities that refer to the understanding of oral speech, reading materials, and materials written by the examinees themselves. The second one tests the expressive abilities of oral speaking, writing, and reading. The third subscale tests the receptive abilities of understanding sign language (words and sentences), while the fourth subscale tests the expressive abilities of signing.

The reliability of the CCS was defined by Cronbach's alpha coefficient, which turned out to be very high (0.973), while its discriminatory power was analysed through its deviation from the normal distribution of scores. We have applied the Kolmogorov-Smirnov test along with the Lilliefors correction and have demonstrated that the distribution of CCS scores does not deviate significantly from the normal distribution, which confirms a good discriminative power of the scale.

Table 1
Significance of deviation from the normal distribution of the CCS scale

	Kolmogorov-Smirnov		
	Statistic	df	Sig.
test_total.	103	60	.177

Nevertheless, although our analysis demonstrates that the distribution is similar to normal, we realize that the coefficient of elongation, kurtosis, deviates from normal limits, i.e. it leans toward negative scores, which reveals a mild platykurtosis of the CCS scale (in fact, its bigger discriminative power). The coefficient of distortion, skewness, was within acceptable limits (Nikolić, 2014).

Matching instruments

The Hiskey-Nebraska Test of Learning Aptitude (Study 1) is very convenient for examining non-verbal intelligence in hard-of-hearing and deaf children. The reliability of the test is acquired by the "split-half" method and the Spearman-Brown's prediction formula. The reliability coefficient is 0.96 (Nikolić, 2014).

For matching, the respondents were tested by the non-verbal REVISK scale. It was standardized and adapted for studies of children with developmental difficulties in Serbia (Hrnjica et. al., 1991) and it has norms for children with hearing difficulties. The reliability of this version of the test ran from 0.75 to 0.93 for particular subtests. We have administered the subtests of Picture Completion Object Assembly, Block Design, Digit Symbol, Picture Arrangement.

Study 1 (The cognitive workshop)

Empirical results produced by the psychology of deafness (Furth, 1966) reveal a delay of deaf children's development in the preoperational stage, as well as a postponed development of concrete operations, especially conservation, which is delayed even until the age of 15.

Our study aimed to experimentally test the value and the efficiency of a systematic application of those non-verbal techniques of work with deaf children that purport to accelerate and advance their cognitive development during the concrete operational stage. Before the beginning, the experimental and the control groups were matched by the degree of hearing loss, intelligence, age, and gender. Moreover, before and after the experiment, the groups were tested by Piaget's cognitive abilities test. The programme of our cognitive workshop – organized only for the experimental group – was based on different forms of non-verbal stimulation and communication through movement, non-verbal dance, drawing, solving of non-verbal problem situations, and tasks that purport to stimulate and develop visual perception, attention, memory, and the logical operations that characterize the operational stage and the formal operational stage. The basis for this workshop was provided by the non-verbal techniques developed by Wolf and Spolinova in Furth's thinking laboratory for deaf children (Furth, 1971).

The techniques were slightly modified and supplemented by Radoman and Nikolić (2000b). We hypothesised that after five-month half-an-hour daily participation in the non-verbal cognitive workshop deaf examinees would have cognitive achievements that are statistically significantly higher than the control group on Piaget's test (that assesses classification and seriation, conservation of weight and volume, mastering of horizontal concepts, understanding of the notion of probability, and ordinal relations).

Method (Study 1)

Sample

The sample in Study 1 consisted of 50 examinees divided into an experimental group (25) and a control group (25). The children aged 8-12 years were grouped after the initial testing with Piaget's cognitive abilities test (Table 2) and according to the degree of hearing loss (expressed in decibels), intelligence (the Hiskey-Nebraska test for deaf children), gender, and age.

Table 2
Study 1 sample

Sample	IQ Nebraska M	Piaget's test M	Hearing loss (dB) M	Age M	Gender	N
E.g.	99.65	19.8	89	10.5	M10 f15	25
C.g.	100.05	20.1	87	10.7	M11 f14	25

Procedures

The main research concept

Study 1 relies on Furth's model of the cognitive workshop as shown in his book *Thinking without Language. Psychological Implications of Deafness* (Furth 1966). He showed that cognitive development does not depend exclusively on language (at least in the initial stages of cognitive development) and that non-verbal thought stimulations are more suitable for deaf children in the developmental period.

The participants in our cognitive workshops visited them five times a week. The children were divided into four groups, with up to six children. The workshops were conducted by trained instructors.

A view of the activities in the cognitive workshop

The workshop's subject matter was adjusted to the level of children's abilities and interests. In the cognitive workshop, the following abilities were practised, stimulated, and developed: motor skills, visual and tactile perception, visual attention, memory, and logic paradigms that are characteristic of the formal operation period. The workshop activities were grouped in the following way: Classification exercises, Pattern discovering exercises, Probability exercises, Perspective exercises, Role play;

Motor skills. The cognitive workshop included all forms of movement, from walking, running, jumping, tossing, catching, and balancing to subtle motor activities of string

beads, arranging cubes, knitting, etc. These exercises develop macro and micro motor skills of the deaf child as a solid base for the development of cognitive operations.

Perception is important for the child's quick adaptation and coping with new situations and problems. Assignments apostrophising the essence of perception require children to perceive changes in the observed place, connect similar and different assignments, and engage in games of passive observation. Creativity and elements of productivity are expressed in them.

Logic. Understanding complex ideas implies setting hypotheses in the process of problem-solving. Logical games, such as classification, series making and numerical operations, help children compare, notice differences, evaluate, and sort out the relevant from the irrelevant more easily. Logical games enable children to study through their intellectual activity.

Creativity. Creative play is a way to notional and symbolic way of thinking. The term "creative play" denotes the games the child creates, completes, and changes. The plays are carried out without any constraint, but with curiosity and interest.

Motivation was encouraged by an active play material in colours and forms familiar to children. Changing dresses, costumes, different accessories, and drawings used in the workshops contributed to a positive motivation for intellectual work.

Data analysis

The initial testing by Piaget's cognitive abilities test was conducted first, after which only the experimental group participated in the non-verbal cognitive workshop that lasted five months (one school semester), while no activities were carried out with the control group. When the cognitive workshop ended, both groups were post-experimentally tested by Piaget's test and group differences were subject to data analysis. The level of significance was $p<0.0008$.

Results (Study 1)

The main focus of result analysis was to determine the effect size (d), most frequently used when the independent variable is dichotomous and the dependent variable continuous, which is the case in our study – the independent variable is the group and the dependent variable is the test/subtest score.

Table 3 demonstrates that there were statistically significant differences in terms of the cognitive development on the overall Piaget test ($t=5.03$, $p=0.0001$) of the examinees in the experimental group on test and retest (after the cognitive workshops). This result confirmed that non-verbal stimulations were effective for cognitive development and mastering of concrete operations. As far as the effect size is concerned (i.e. the practical significance of the obtained result), it was very big ($d=1.86$).

There were statistically significant differences between the test and retest scores achieved by the examinees who solved tasks implying cognitive operations of volume conservation ($t=4.57$, $p=0.0003$).

Table 3

Testing statistical differences between the arithmetic means in the experimental group on test and retest of Piaget's cognitive abilities test[1]

Test name	Test		Retest		t	Df	P	Effect size (d)	N
	AM	SD	AM	SD					
Piaget's test	19.33	4.14	29.58	6.62	5.03	23	0.0001	1.86	25
Matrix classification	4.33	1.27	6.29	0.99	2.25	23	0.1000	-	25
Conservation of weight	1.75	1.52	3.79	2.26	3.85	23	0.0801	-	25
Conservation of volume	2.38	1.24	3.96	1.71	4.57	23	0.0003	1.06	25
Horizontal concept	4.71	1.27	6.08	1.49	2.90	23	0.0123	0.99	25
Probability	2.04	1.37	4.38	1.28	2.91	23	0.1142	-	25
Ordinal relations	4.13	1.30	5.08	1.28	2.58	23	0.0169	0.74	25

Namely, the effect size was 1.06, which indicates a very big effect. There were statistically significant differences between the test and retest scores achieved by the examinees who solved tasks relating to horizontal concepts (t=2.90, p=0.0123); the effect size was 0.99, which indicates a very big effect.

There were statistically significant differences between the test and retest scores achieved by the examinees who solved tasks relating to ordinal relations (t=2.58, p=0.0169); the effect size was 0.74, which indicates a medium (typical) effect.

Table 4

Testing statistical differences between the arithmetic means of the experimental group and the control group on the retest of Piaget's cognitive abilities test[2]

Test name	Experimental group		Control group		T	df	P	Effect size (d)	N	
	AM	SD	AM	SD					Eg	Cg
Piaget's test	29.58	6.62	22.63	4.35	4.3	46	0.0008	1.24	25	25
Matrix classification	6.29	0.99	5.88	1.04	1.42	46	0.1626	-	25	25
Conservation of weight	3.79	2.26	2.17	1.29	3.15	46	0.0029	0.84	25	25
Conservation of volume	3.96	1.71	2.29	0.62	4.49	46	0.0000	1.29	25	25
Horizontal concept	6.08	1.49	5.13	1.23	2.51	46	0.1565	-	25	25
Probability	4.38	1.28	3.33	1.71	2.39	46	0.0210	0.7	25	25
Ordinal relation	5.08	1.28	4.13	1.39	2.48	46	0.0169	0.71	25	25

[1] AM - arithmetic mean, SD - standard deviation, t - t test, df - degrees of freedom, p - level of significance, d - effect size, N - number of respondents.

[2] AM - arithmetic mean, SD - standard deviation, t - t test, df - degrees of freedom, p - level of significance, d - effect size, N - number of respondents.

Table 4 demonstrates that there were statistically significant differences in cognitive development on the overall Piaget test (t=4.3, p=0.0008). This result confirmed that non-verbal stimulations were effective for cognitive development and mastering of concrete operations. As for the effect size (i.e. the practical significance of the obtained result), it was very big (d=1.24). There were also statistically significant differences between the examinees from the experimental group and the examinees from the control group who solved tasks implying the cognitive operation of weight conservation (t=3.15, p=0.0029); the effect size was 1.06, which indicates a very big effect. There were also statistically significant differences between the examinees from the experimental group and the examinees from the control group who solved tasks implying the cognitive operation of volume conservation (t=4.49, p=0.0000); the effect size was 1.29, which indicates a very big effect. There were also statistically significant differences between the examinees from the experimental group and the examinees from the control group who solved tasks relating to probability (t=2.39, p=0.0210); the effect size was 0.70, which indicates a medium (typical) effect. There were also statistically significant differences between the examinees from the experimental group and the examinees from the control group who solved tasks relating to ordinal relations (t=2.48, p=0.0169); the effect size was 0.71, which indicates a medium (typical) effect. Finally, if we talk about individual achievements of participants from the experimental group, we suppose that slower advancement from some participants from EG could be explained by the fluctuation of attention, as well as by weaker motivation in the final testing.

Study 2 (The communication workshop)

The study purported to test the influence of a systematic application of sign language on Serbian oral (spoken) language (on the receptive and expressive levels as well as on the deaf children's overall communication ability and school achievement). In the documentation of Italian sign language grammar, it is pointed out that what spoken language achieves with propositions, conjunctions, and lexical changes is what sign language achieves with functionalization of the space that surrounds the interlocutors as well as with a movement of arms, fingers, and facial expression that binds several elements into a unique sign (Teruggy, 2003).

We hypothesised that the cohesion between the Serbian sign language abilities and Serbian oral language would be achieved, thus improving school achievement. The experimental and the control groups were matched by the degree of hearing loss, intelligence, school achievement, age, and gender. Before and after the experiment, the groups were tested by the Communication Competence Scale for Deaf Children The communication workshop for teaching deaf children Serbian sign language lasted five months. The children from the experimental group spent 45 minutes (one school lesson) every day learning signs for over 300 notions from their immediate surrounding and practising sentence formation in sign language through play, interesting tasks,

and group situations. In these activities, the children used *A Primer of Sign Language* and *A Sign Language Exercise Book*.

Method (Study 2)

Sample

The sample in Study 2 consisted of 60 deaf examinees divided into an experimental group (30) and a control group (30). The groups included children aged 8 to 12 and each group had approximately the same number of boys and girls. They had the same auditory status and had similar results on the non-verbal part of the REVISK test, the Communication Competence Scale (CCS) and school achievement (Table 5).

Table 5
Study 2 Sample

Sample	IQ REVISK	CCS	Hearing loss (dB) M	School achievement M	Age M	Gender m	Gender f	N
E.g.	93.96	51,1786	88	4.18	9.10	15	15	30
C.g.	92.75	49,6000	86	4.15	10.0	14	16	30

Procedure

Study 2 included an experiment that introduced the communication workshop as a five-month mandatory school activity only for the members of the experimental group. The experimental and the control groups had previously been tested by the CCS and the REVISK and were matched by their relevant characteristics. We need to stress that all the examinees were students of a school for deaf children where sign language was not taught or used as the class language. Relatedly, all the examinees could get familiar with sign language, which influenced the initial results of the CCS test used for group matching. The data on school achievement were also gathered at the beginning of the experiment.

The participants of the experimental group were divided into six subgroups with a maximum of five members in each group. Each member of the experimental group attended the workshop five times a week, which amounted to a hundred lessons per each examinee in the entire experiment. The participants of the control group weren't included in the workshop. The final study phase lasted one month. In this period, all examinees were retested by the Communication Competence Scale, while the data on school achievement were gathered at the end of the school year. The post-experimental results of the experimental group and control groups were statistically compared.

A view of the activities in the communication workshop

The communication workshop relied on the activities that Hans Furth conceptualized and applied in 1970 in a school in West Virginia (Nikolić, 2009). The Belgrade Center for Integral Development of Deaf Children has adapted and modernized the concept of communication workshops that was applied in West Virginia. For the needs of Study

2, the educational means used in the workshop were *A Primer of Sign Language* and *A Sign Language Exercise Book* (created by the authors of this research). The *Primer* contains three hundred notions grouped into ten thematic fields (nature, family, school, home, city, village, communications, mood, feelings, and abstract notions). Each notion is accompanied by a drawing, as well as by a drawing of the sign representing it, while the notion's name is indicated in a written manner. The *Exercise Book* contains a hundred exercises and its content follows the *Primer* (Radoman & Nikolić, 2013).

The communication workshop's method is characterized by a gradual approach (from the unknown to the known) as well as by the principle of behavioural reinforcement. The workshop tasks and plays first focused on gradual learning of individual signs for particular referents (demonstrated live, as well as by drawings and photographs), then on their combining into sign syntagms, and finally on discourse and their use in situations of dyadic and polyadic communication with group members, which represented exercises of the expressive and receptive levels for each thematic whole. The respondents in the experimental group used the ten thematic wholes given in the *Primer* to first learn the signs for particular notions, thus progressively expanding their understanding of the meaning of situations demonstrated by sign syntagms and sign sentences. Having acquired the receptive sign level, they gradually acquired the expressive sign production and mutual sign communication. The workshop facilitators were trained by the authors of the programme (the same who designed the *Primer* and the *Exercise Book*).

Results of Study 2

Table 6

Testing statistical differences between the arithmetic means in the experimental group on test and retest of the Communication Competence Scale

Test name	Test		Retest		T	Df	P	Effect size (d)	N
	AM	SD	AM	SD					
CCS	47.333	21.961	105.333	25.152	9.51	29	0.000	2.46	30
Subtest 1	11.733	5.245	21.2	6.139	6.42	29	0.000	1.66	30
Subtest 2	3.667	3.066	7.133	1.934	5.23	29	0.000	1.35	30
Subtest 3	6.733	4.346	13.2	1.126	7.89	29	0.000	2.04	30
Subtest 4	4.333	3.066	9.067	3.814	5.3	29	0.000	1.37	30
Subtest 5	2.467	1.502	3.806	0.543	4.56	29	0.000	1.19	30
Subtest 6	2.3	1.055	3.433	0.898	4.48	29	0.000	1.16	30
Subtest 7	1.967	1.474	4	0	7.56	29	0.000	1.95	30
Subtest 8	1.667	1.398	3.6	0.968	6.23	29	0.000	1.61	30
Subtest 9	4.8	1.864	6.767	1.736	4.23	29	0.0001	1.09	30
Subtes 10	2.767	2.3	6.1	2.398	5.5	29	0.000	1.42	30
Subtes 11	2.333	2.073	5.867	2.285	6.27	29	0.000	1.62	30
Subtes 12	1.462	1.749	5.034	3.448	4.76	29	0.000	1.31	30
Subtes 13	2.933	3.044	12.733	6.203	7.56	29	0.000	2.01	30
Subtes 14	1.867	1.737	2.4	2.061	1.08	29	0.2829	–	30

[3] AM - arithmetic mean, SD - standard deviation, t - t test, df - degrees of freedom, p - level of significance, d - effect size, N - number of respondents.

Table 6 demonstrates that there were statistically significant differences between the examinees from the experimental group on test and retest (after the communication workshops) in terms of the global communication ability (t=9.51, p=0.0000). As for the effect size (i.e. the practical significance of the obtained result), it was very high (d=2.46), in fact, higher than usual.

There were statistically significant differences (p<0.01) between the examinees from the experimental group on test and retest of all other subtests assessing the verbal expressive ability of writing and the verbal receptive ability of writing, except Subtest 14. As for the effect size, an unusually high effect is obtained on Subtest 3 (d=2.04) and Subtest 13 (d=2.01). On all other subtests, there was also a very high effect size (d>1), although it was a bit lower than in the aforementioned Subtests 3 and 13.

Namely, some of them demonstrated a broader fluctuation of attention, which is perhaps a possible reason for the weakening of their motivation and, consequently, their poorer test results.

Table 7

Testing statistical differences between the arithmetic means of the experimental group and the control group on the retest of the Communication Competence Scale

Test name	Experimental group		Control group		t	df	p	Effect size (d)	N	
	AM	SD	AM	SD					Eg	Cg
SKS	105.333	25.152	52.667	25.452	8.06	58	0.0000	2.08	30	30
Subtest 1	21.2	6.139	14.839	5.365	3.94	58	0.0002	1.1	30	30
Subtest 2	7.133	1.934	3.333	3.032	5.78	58	0.0000	1.49	30	30
Subtest 3	13.2	1.126	6.8	4.021	8.4	58	0.0000	2.17	30	30
Subtest 4	9.067	3.814	6.6	3.276	2.69	58	0.0094	0.69	30	30
Subtest 5	3.806	0.543	2.581	1.285	4.98	58	0.0000	1.24	30	30
Subtest 6	3.433	0.898	2	1.365	4.81	58	0.0000	1.24	30	30
Subtest 7	4	0	2.333	1.422	6.42	58	0.0000	1.66	30	30
Subtest 8	3.6	0.968	1.8	1.324	6.01	58	0.0000	1.55	30	30
Subtest 9	6.767	1.736	4.333	1.729	5.44	58	0.0000	1.4	30	30
Subtes 10	6.1	2.398	3.267	1.893	5.08	58	0.0000	1.31	30	30
Subtes 11	5.867	2.285	2.4	2.078	6.15	58	0.0000	1.59	30	30
Subtes 12	5.034	3.448	1.867	2.161	4.24	58	0.0001	1.1	30	30
Subtes 13	12.733	6.203	3.097	2.759	7.69	58	0.0000	2.01	30	30
Subtes 14	2.4	2.061	1.103	1.102	3.1	58	0.0030	-0.03	30	30

Table 7 shows that there were statistically significant differences between the examinees from the experimental group who had attended communication workshops daily and the examinees from the control group in terms of the global communication ability (t=8.06, p=0.0000). As far as the effect size is concerned (i.e. the practical significance of the obtained result), it was very high (d=2.08), in fact, higher than usual.

[4] AM - arithmetic mean, SD - standard deviation, t - t test, df - degrees of freedom, p - level of significance, d - effect size, N - number of respondents.

The experimental group also made statistically significant progress compared to the control group ($p<0.01$) on all other subtests assessing the verbal expressive ability and the verbal receptive ability. As far as the effect size is concerned, an unusually high effect was obtained on Subtests 3 and 13 (d=2.17 and 2.01, respectively). There was a very high effect – although a bit lower than in the two subtests mentioned above – on Subtest 1 (d=1.10), Subtest 2 (d=1.49), Subtest 5 (d=1.24), Subtest 6 (d=1.24), Subtest 7 (d=1.66), Subtest 8 (d=1.55), Subtest 9 (d=1.40), Subtest 10 (d=1.31), Subtest 11 (d=1.59) and Subtest 12 (d=1.10). On Subtest 4, there was a medium (typical) effect (d=0.69), while on Subtest 14 (d=-0.03) there was a very low effect, in fact, significantly lower than expected.

Table 8

Testing statistical differences between the arithmetic means of the experimental group and the control group in terms of school achievement on the retest

	Experimental group		Control group		t	Df	p	Effect size (d)	N
	AM	SD	A M	SD					
School achievement	4.58	0.44	4.07	0.70	3.415	58	0.001	0.88	60

The school achievement of the experimental group (expressed with an average mark) was statistically considerably different than the school achievement of the control group (t=3.415, df=58).

This means that after the communication workshops the examinees from the experimental group had better school achievement than the examinees from the control group. The effect size was high (d=0.88).

Table 9

Correlation of non-verbal and verbal results on the Communication Competence Scale

	Sign tasks-initially	Sign tasks-finally	Verbal tasks-initially	Verbal tasks-finally
Sign tasks-initially Pearson Correlation Sig. (2-tailed)	–	0.494** 0.000	0.738** 0.000	0.546** 0.000
Sign tasks-finally Pearson Correlation Sig. (2-tailed)	–	–	0.462** 0.000	0.871** 0.000
Verbal task-initially Pearson Correlation Sig. (2-tailed)	–	–	–	0.581** 0.000
Verbal tasks-finally Pearson Correlation Sig. (2-tailed)	–	–	–	–

**Correlation is significant at level 0.01

[5] AM - aritmetic mean, SD - standard deviation, t - t test, df - degrees of freedom, p - level of siginicance, d - effect size, N - number of respondents.

The emphasis of Study 2 was also on testing the size effect *d* and Pearson's correlation coefficient. The distribution of responses on the subscales was normal because skewness and kurtosis went from -2 to +2 (George & Mallery, 2010). The size effect *d* refers more to the difference magnitude than to the strength of association between the two variables as is the case with Pearson's correlation coefficient.

Discussion

The question is why a certain number of relevant scientific literature demonstrated that deaf children have lower levels of academic achievement than their hearing peers (DeLana et al., 2007; Marschark et al., 2015), Shaver, Nagle & Newman, 2015). Their academic achievement represents the result of a complex interplay of many factors that, according to Marschark and Spencer (2003), include characteristics of the students (e.g., hearing threshold, language fluency, mode of communication, and communication functioning), characteristics of their family environment (e.g., parent education level, socio-economic status) and experiences inside and outside school. Programs of cognitive acceleration in several hundred regular schools all over the world (Matejić- Đuričić & Stojković, 2011) have revealed progress of students on the tasks that demand the level of concrete operations and the level of formal operations according to Piaget's theory. Moreover, the students demonstrated a bigger overall school achievement, especially in mathematics. The results of Study 1 as well confirmed the success of nonverbal techniques adjusted to deaf children that we have applied in that research to achieve cognitive acceleration. Also, Wellman and Peterson (2013) consider that language acquisition and comprehensible spoken and/or sign communication from infancy are essential for the development of cognition and normal timetable. Children with language delays and impoverished communicative interactions are significantly delayed in several aspects of their verbal and non-verbal cognitive development. The results of this research showed that the systematic application of non-verbal stimulations, such as cognitive tasks, games and exercises, significantly enhanced certain logical operations characteristic for the operational period – the concrete operational stage (Furth, 1966; Meadow, 1968; Radoman & Nikolić, 2000b, Courtin, 2000; Wellnam & Peterson, 2013). When we discussed sign language, a lack of systematic support to the development of sign language is still present, which reflects the situation in the Republic of Serbia as well. In Serbia, only 0.34 % of the deaf under the age of 30 manage to start and complete academic studies (Nikolić, Lukić & Janković, 2010). In the countries where sign language is present and where there is support to the learning of sign language from the early age on, that percentage is much bigger (Grosjean, 2001; Mahshie, 2007, Teruggy, 2003). Danish sign language and Danish language represent the official goal of all schools for deaf children in that country (Engberg-Pedersen, 1993). The research carried out by the professors of Gallaudet University for deaf children, conducted in 64 % on all deaf students in the USA, revealed that insufficient results of deaf students are a consequence of the fact that sign language was not taught from the early age

on (Regan, 2010). Moreover, the results have shown that children who start learning sign language comparatively earlier on have a cognitive, communicational, and social functioning that is equal to the one of their peers. Finally, the results have shown that the learning of sign language facilitates the learning of the language of the majority (Allen, 1986; Lucaus & Valli, 1989; Paul & Quigley, 1987; Reagan, 2010; Sallabank, J. 2013). As a result of many years of gathering scientific knowledge about the importance of sign language in the United States of America, in particular, and Scandinavian countries have a huge corpus of documented material for sign language (Reagan, 2010). As well as the results of many research, Study 2 indicates that systematically learning Sign language improves communication skills as well as curricular outcomes in all subjects.

Empowerment from sign language research and information is yet to come. In many countries, descriptions of the linguistic system have been shown to produce a shift in ideologies of a language and bring a change in attitudes towards a language (Hill, 2015; De Clerck, 2007).

Study limitations

Our study did not control for a possible availability of sign language in extracurricular situations. In this respect, the manner of communication in the respondents' families is undoubtedly of the utmost importance. Nevertheless, given that sign language in Serbia is not standardized and that the parents of deaf children are not systematically trained in sign language, we assumed that the effects of this variable were minimal. Moreover, our study did not control for the hearing status of the parents, which could be related to the manner of communication in the families, because our previous experience demonstrated that a very small percentage of the parents of deaf children also had a hearing impairment. Since our study represents a tentative project of application of our method of integral development of deaf children, we recommend that future research establish better control of environmental influences, especially extracurricular ones, such as the dominant manner of communication in the family and the use of Serbian sign language (or its possible knowledge by their parents or siblings).

Conclusion

The Method of Integral Development of Deaf Children was constructed and has been used for years in practical work with deaf children. In the research part of this paper, we have presented some particular techniques of this method that had been experimentally tested. They were inspired by Furt's thought laboratory (1966) for deaf children as well as by the work of Klima and Bellugi (1979). This experimental research has empirically verified the developmental effects of the applied workshop techniques developed within the Integrated Developmental Method of Deaf Children. Future research should spread the use of the Integral Development Method for Deaf Children to younger deaf children as well (and entail implicit modifications of the

technique), to see if the effects of this method are better when applied in an early period, which can be expected. Moreover, future research should examine the effects in children with combined difficulties and various degrees of hearing impairment. Repeated studies in similar samples, but also application of the method in larger ones, will offer new empirical proofs and, we believe, produce new arguments for practical applications of our approach. Finally, the current situation points to the necessity of preparing comprehensive strata on Serbian Sign Language and harmonization with international documents and recommendation.

References

Albrecht, G. L., Snyder, S. L., Bickenbach, J., Mitchell, D. T., & Schalick III, W. O. (Eds.). (2006). *Encyclopedia of disability (Vol. 1).* London: Sage. https://doi.org/10.4135/9781412950510

Allen, T. E. (1986). Patterns of academic achievement among hearing impaired students: 1974 and 1983. *Deaf children in America*, 161-206.

Bench, R. J. (1993). *Communication Skills in Hearing Impaired Children. Studies in Disorders of Communication*. London: Whurr Publishers Ltd.

Courtin, C. (2000). The impact of sign language on the cognitive development of deaf children: The case of theories of mind. *Journal of deaf studies and deaf education, 5*(3), 266-276. https://doi.org/10.1093/deafed/5.3.266

Cassirer, H. (1978). *Ogled o čoveku*. Zagreb: Naprijed.

De Clerck, G. (2007). Meeting global Deaf peers, visiting ideal Deaf places: Deaf ways of education leading to empowerment, an exploratory case study. *American Annals of the Deaf, 152*(1), 5-19. https://doi.org/10.1353/aad.2007.0009

De Lana, M., Gentry, A. M., & Andrews, J. (2007). The efficacy of ASL/English bilingual education: Considering public schools. American Annals of the Deaf, 152(1), 73-87. https://doi.org/10.1353/aad.2007.0010

Dimić, N. (2003). *Govorno-jezički deficiti kod gluve i nagluve dece: ogledi o jeziku gluvih i nagluvih*. Beograd: Društvo defektologa Srbije i Crne Gore.

Dulčić, A. (2016). SUVAG's paths of verbotonal method in dimensions of past, present and future. In E. Bakota et al (Eds.), Translational Approach in Diagnostics and Rehabilitation of Listening and Speech -55 years of SUVAG (pp.72-86). Zagreb: Poliklinika SUVAG.

Engberg-Pedersen, E. (1993). *Space in Danish Sign Language: The semantics and morphosyntax of the use of space in a visual language*. Peer Review Publisher: SIGNUM-Press.

Furth, H. (1966). *Thinking without Language, Psychological Implications of Deafness*. New York: The Free Press.

Furth, H. (1971). *A Thinking Laboratory Adapted for Deaf Children*. Belmont, CA: Wadsworth Publishing Company.

Furth, H. (1972). *Deafness and Learning, a Psychosocial Approach*. Belmont , California: Wadsworth Publishing Company.

Gregory, S., Knight, P., McCracken, W., Powers, S., & Watson, L. (1999). *Issues in Deaf Education*. London: David Fulton Publishers.

George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10a ed.)* Boston: Pearson.

Grosjean, F. (2001). *The right of the deaf child to grow up bilingual*. Washington, DC: Gallaudet University Press. https://doi.org/10.1353/sls.2001.0003

Guberina, P. (1972). *Case studies in the use of restricted bands of frequencies in auditory rehabilitation of deaf*. Zagreb: Institute of Phonetics.

Guberina, P. (2010). *Govor i čovjek-verbotonalni sistem*. Zagreb: ArTRESOR naklada.

Hill, J. C. (2015). Language attitudes in Deaf communities. In A. C. Schembri, & C. Lucas (Eds.), *Sociolinguistics and Deaf Communities* (146-174). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781107280298.007

Hrnjica, S., Bala, J., Dimčović, N., Novak, J., Popović, D., Radoman, V., Radonjić, J., & Živković, G. (1991), *Omteno dete, uvod u psihologiju ometenih u razvoju*. Beograd: Zavod za udžbenike i nastavna sredstva.

Irvine, J. T., & Gal, S (2000). Language ideology and linguistic differentiation. In P. V. Kroskrinsky (Ed.), *Regimes of language: Ideologies, polities, and identities* (35-84). Santa Fe, NM: School of American Research Press.

Johnson R. E., Liddell, S. K., & Erting, C. J. (1989). *Unlocking the Curriculum: Principles for Achieving Access in Deaf Education*. Washington, DC: Gallaudet University.

Klima, E., & Bellugi, V. (1979). *The Sign of Language*. Cambridge, MA:Harvard University Press.

Kusters, A. (2014). Language ideologies in the shared signing community of Adamorobe. *Language in Society, 43*(2), 139-158. https://doi.org/10.1017/S0047404514000013

Knoors, H., & Marschark, M. (2012). Language planning for the 21st century: Revisiting bilingual language policy for deaf children. The Journal of Deaf Studies and Deaf Education, 17(3), 291-305. doi:10.1093/deafed/ens018

https://doi.org/10.1093/deafed/ens018

Lane, H. (1984). *When the mind hears: A history of the Deaf*. New York: Random House.

Levine, E. S. (1981). *The Ecology of Deafness*. New York: Columbia University Press.

Lucas, C., & Valli, C. (1989). Language contact in the American deaf community. In: (Ed. Lucas, C.). The sociolinguistics of the deaf community. *Elsevier*, 11-40. /online/. Retrieved on 22th February 2017 from https://www.sciencedirect.com/science/article/pii/B9780124580459500082; https://doi.org/10.1016/B978-0-12-458045-9.50008-2

Marschark, M. (1993). *Psychological Development of Deaf Children*. New York: Oxford University Press.

Marschark, M., Shaver, D. M., Nagle, K. M., & Newman, L. A. (2015). Predicting the academic achievement of deaf and hard-of-hearing students from individual, household, communication, and educational factors. *Exceptional children, 81*(3), 350-369. https://doi.org/10.1177/0014402914563700

Marschark, M., & Spencer. P. E. (2003). *Oxford Handbook of Deaf Studies, Language, and Education*. New York: Oxford University Press.

Mahshie, Sh. N. (2007). *Dvojezično obrazovanje gluhe djece-iskustva iz Švedske i Danske*. Zagreb: URIHO.

Miholić, D., & Martinec, R. (2013). Some aspects of using expressive arts-therapies in education and rehabilitation. *Specijalna edukacija i rehabilitacija, 12*(2), 221-240. https://doi.org/10.5937/specedreh12-3506

Matejić-Đuričić, Z., & Stojković, I. (2011). *Psihologija inteligencije*, *CIDD*. Fakultet za specijalnu edukaciju i rehabilitaciju Univerziteta u Beogradu.

Nikolić, G., (2009). *Znakovni jezik i njegov značaj za razvoj dece oštećenog sluha*. Beograd: Zavod za unapređivawe obrazovanja i vaspitanja.

Nikolić, G., Lukić,M., & Janković,V. (2010). *Deca I učenici sa smetnjama u razvoju u obrazovno vaspitnim ustanovama R. Srbije*. Beograd: Zavod za unapređivanje obrazovanja i vaspitanja.

Nikolić, G. (2014). *Teorija i praksa obrazovanja učenika sa smetnjama u razvoju*. Sombor: Pedagoški fakultet u Somboru.

Nikolić, M., Ostojić, S. & Mirić., D. (2014). Primena upitnika za roditelje u proceni auditivnih sposobnosti gluve i nagluve dece. In J. Kovačević, & D. Maćešić-Petrović (Eds.), *Proceedings of the 8th international conference Special education and rehabilitation today* (65-73). Beograd: Fakultet za specijalnu edukaciju i rehabilitaciju.

Nikolić, G., & Raičević, D. (2018). Translational approach in diagnostics and rehabilitation of listening and speech-55 years of SUVAG (Eds.) *Serbian sign language in working with children with ASD* (pp.159-179). Zagreb: Poliklinika SUVAG.

Piaget, J. (1968). *Psihologija inteligencije*. Beograd: Nolit.

Piaget, J., & Inhelder, E. (1986). Intelektualni razvoj deteta, Beograd: Zavod za udžbenike i nastavna sredstva.

Paul, P. V., & Quigley, S. (1987). Using American sign language to teach English. *Language learning practices with deaf children*, 139-166.

Phillips, J. (1969). *The Origins of Intellect Piaget's Theory*. San Francisco: Freeman and company.

Quer, J., & Muller de Quadros, R. (2015). Language policy and planning in Deaf communities. In Adam C. Schembri, & Ceil Lucas (Eds.), *Sociolinguistics and Deaf communities*, 120-145. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781107280298.006

Radoman,V., & Nikolić ,G. (2000a). *Skala komunikativnih sposobnosti dece oštećenog sluha*. Beograd: Centar za integralni razvoj gluve dece.

Radoman,V., & Nikolić, G. (2000b). *Kognitivna radionica za gluvu decu*. Beograd: Centar za integralni razvoj gluve dece & Save the Children.

Radoman.V. (2011). Deskripcija i komparativna analiza različitih modela ometenosti i efekti njihove praktične primene na ličnost. Beograd: *Beogradska defektološka škola, 17*(3), 51-63.

Radoman,V., & Nikolić,G. (2013). Uloga znakovnog jezika u unapređivanju komunikativne sposobnosti i školskog uspeha dece sa oštećenjem sluha. *Psihologija, 46*(1), 71-91. https://doi.org/10.2298/PSI1301077R

Radoman,V. (2015). *Surdopsihologija*. Beogradu: Fakultet za spercijalnu edukaciju i rehabilitaciju.

Reagan, T. G. (2010). *Language policy and planning for sign languages*. Gallaudet University Press.

Savić, Lj. M. (1986). *Metodika učenja govora gluve dece*. Beograd: Zavod za udžbenike i nastavna sredstva.

Sallabank, J. (2013). Attitudes to endangered languages: Identities and policies. Cambridge University Press. https://doi.org/10.1017/CBO9781139344166

Stokoe, W. C. Jr. (2005). Sign language structure: an outline of the visual communication systems of the American deaf. *Journal of Deaf Studies and Deaf Education, 10*(3), 3-37. https://doi.org/10.1093/deafed/eni001

Teruggy, L. A. (2003). *Una scuola due lingue. L'esperienta di bilinguismodella scola dell'infanzia ed Elementare di Cossato.* Milano: Franco Angeli s.r.l.

Timmermans, N. (2005). *The status of sign languages in Europe*. Strasbourg: Council of Europe.

Vigotski, L. (1996). *Osnovi defektologije*. Beograd: Zavod za udžbenike i nastavna sredstva.

Wellnam, H. M., & Peterson, C. C. (2013). Theory of mind, development and deafness. In S. Baron-Cohen, H. Tager-Flusberrg., & M. Lombardo (Eds.), *Understanding Other Minds: Perspectives from developmental social neuroscience* (pp.51-76). London: Oxford University Press.

Živković, M. (1996). *Psihologija gluve i nagluve dece i omladine*. Beograd: Zavod za udžbenike i nastavna sredstva.

Gordana Nikolić
Faculty of Education in Sombor
University of Novi Sad
Radovana Miloševića 16, 11 000 ,Belgrade, Serbia
gocadra@gmail.com

Vesna Radoman
Faculty of Special Education and Rehabilitation
University of Belgrade
Zmaja od Nocaja 3a, 11 000, Belgrade, Serbia
radomanvesna@yahoo.com

Sanja Dimoski
Faculty of Special Education and Rehabilitation
University of Belgrade
Narodnih heroja 54/17, 11070, New Belgrade, Serbia
sanja.dimoski@gmail.com

Empirijska provjera Metode integralnoga razvoja gluhe djece

Sažetak

Empirijski nalazi, koji ukazuju na teškoće gluhe djece u nekim područjima kognitivnog, afektivnog i emocionalno-socijanog razvoja, poslužili su kao osnova za osmišljavanje Metode integralnoga razvoja gluhe dece. Pored toga postavke Svjetske federacije gluhih (WFD) usmjerene na važnost znakovnoga jezika, pedstavljale su širi okvir za postavljanje Metode. Prvi dio rada posvećen je prikazu generalnoga koncepta Metode. Istraživački dio ispituje rezultate dvije eksperimentalno kontrolirane studije. Studija 1 bavila se ispitivanjem učinaka neverbalnih stimulacijskih tehnika na kognitivni razvoj. U Studiji 2 ispitivani su učinci sustavne primjene znakovnoga jezika na komunikativne i obrazovne aspekte razvoja gluhe djece. Podatci u okviru studije 1 prikupljeni su upotrebom Piagetova testa, dok je u studiji 2 korištena Skala komunikacijskih sposobnosti. Uzorak studije 1 uključio je 50 ispitanika, a 60 ispitanika je bilo u studiji 2. Uzorak su bili gluhi učenici od 8 do 12 godina. Dobiveni rezultati potvrdili su da je primjena neverbalnih radioničkih aktivnosti i tehnika potaknula kognitivni razvoj i konkretno unaprijedila operacionalizirane faze razvoja. Također, sustavna primjena srpskog znakovnog jezika potaknula je uporabu srpskog govornog jezika, globalne komunikacijske sposobnosti gluhe djece, kao i povećanje kohezije znakovnih i govornih komunikativnih sposobnosti. Znakovni je jezik također utjecao na poboljšanje školskoga uspjeha.

Ključne reči: *kognitivni razvoj; komunikacija; neverbalni pristup; znakovni jezik*

Uvod

Različiti pristupi razvoju gluhe djece utjecali su na kreiranje velikog broja, često potpuno suprotnih rehabilitacijskih i obrazovnih programa, koji su se razvijali i mijenjali od sredine osamnaestoga stoljeća do danas (Radoman & Nikolić, 2013). Prosvjetiteljski duh i nove ideje u radu s gluhom djecom pokrenuli su Charles-Michel de l'Épée (1712.-1789.) i njegov sljedbenik Abbé Roche Ambroise Cucurron Sicard (1742.-1822.) koji su prepoznali znakovni jezik kao ključnu komponentu u radu s gluhom djecom (Lane, 1984).

Povijesno promatrano, pomicanje težišta s poremećaja i nemogućnosti na sačuvane kapacitete gluhe djece kao i utiranje puta socijalnom modelu, omogućuje teorijski pristup Lava Vigotskog (1996.) koji zapravo postavlja temelje za mnogo kasnije razvijenu socijalnu inkluziju i inkluzivno obrazovanje.

Piagetova teorija kognitivnoga razvoja također je bila vrlo inspirativna za psihologiju gluhih, posebno za Hansa Furtha (Furth 1966;1971) koji se oslanja na Piagetovo shvaćanje o nejezičnim korijenima inteligencije i mogućnostima nesmetanoga intelektualnog razvoja gluhe djece usprkos njihovom jezičnom deficitu. Tako počinju značajne promjene u radu s gluhom djecom, prvo u Sjedinjenim Američkim Državama, a nešto kasnije i u Europi, kada jedan broj specijalnih škola uvodi programe koji uključuju znakovni jezik (ZJ) kao jezik koji pripada lingvističkoj porodici verbalnih jezika, kao i širok spektar neverbalnih modela za stimulaciju razvoja gluhe djece (Klima i Bellugi, 1979). Kasnije se javljaju i mnoge studije koje se bave istraživanjem znakovnoga jezika gluhih (De Clerck, 2007; Gregory, Knight, McCracken, Powers i Watson, 1999; Johnson, Liddell i Erting, 1989; Radoman i Nikolić, 2013; Quer i Muller de Quadros, 2015).

U nekim zemljama već više od dvadeset pet godina (u većini ostalih odnedavno) pristupi obrazovanju gluhe dece usmjereni su prema dvojezičnosti koja uključuje znakovni te pisani i govorni jezik koji se smatraju osnovnom edukativnom intervencijom za gluhu djecu (Knoors & Marschark, 2012).

Naknadno preispitivanje politike obrazovanja gluhih i jezičnoga planiranja svakako će zahtijevati ponovno razmatranje uloge i mjesta znakovnoga jezika u odgoju i obrazovanju gluhe djece. Takav vid preispitivanja ne postavlja pitanje važnosti znakovnih jezika kao što su američki znakovni jezik (ASL), nizozemski znakovni jezik (SLN) ili bilo koji drugi znakovni jezik, kao ni dvojbu oko važnosti znakovnih jezika kao izraza kulturne i jezične identifikacije gluhih ili jesu li znakovni jezik i kultura gluhih ključni stupovi zajednice gluhih, odnosno je li odrastanje sa znakovnim jezikom i kulturom gluhih korisno za gluhu djecu (Albrecht i dr. 2006). Ipak, treba imati na umu da je značajan broj literature i radova u ovom području baziran na tradicionalnom oralnom/govorom pristupu, što značajno ideološki utječe na praksu jezičnoga planiranja, kao i strateškoga planiranja obrazovanja gluhih, ali i na samu svijest gluhih osoba o razumijevanju dimenzije i značaja znakovnoga jezika. Prvi znaci promjene u ukupnom sagledavanju identiteta i jezične platforme gluhih nastaju porastom internacionalne suradnje organizacija gluhih uz sporadičnu, ali prisutno rastuću sustavnu podršku gluhim osobama, što je dovelo do rapidnih promjena i u samoj svijesti gluhih i pristupa ovoj temi od strane njihovih organizacija (De Clerck, 2007). Konačno, i ne manje važno, taj val podrške doprinjeo je i kompleksnijem sagledavanju ukupne lingvističke dimenzije znakovnih jezika (ZJ), bar u zemljama koje sustavno podržavaju razvoj nacionalnih ZJ. Ipak, važno je naglasiti da je pristupačnost kvalitetnim seminarima za edukaciju tumača i korisnika znakovnoga jezika, u mnogim zemljama diskutabilan kao i nedovoljna ponuda edukativnoga materijala za učenje ZJ (rječnici, gramatike, udžbenici, i sl). Pored svega navedenog, leksikografski rad u kontekstu pripreme rječnika za ZJ, najčešće nudi rječnike koji crtežima i fotografijama predstavljaju značenje različitih znakova. Bitan nedostatak aktualno definiranih pristupa u pripremi rječnika je kriva pretpostavka da svaki znak ima analognu dimenziju jednoga značenja napisane riječi s kojom je u rječniku povezan (Irvine i Gal, 2000). Takavim načinom pripreme rječnika

u kojem se jedan znak smatra ekvivalentom riječi govornoga jezika propušta se prilika prepoznavanja i razumijevanja kompleksnosti i lingvističke vertikale znakovnoga jezika i njegove semantičke i sintaktičke dimenzije (Kusters, 2014).

Kada govorimo o situaciji u ovom području u Srbiji, ultimativnost ili „obožavanje"govora ('deification of speech') (Lane,1984,101) bio je i još uvijek jest dominantni pristup u obrazovanju gluhih. Dovoljno je samo pregledati radove i istraživanja u području gluhoće i nagluhosti (npr. Savić, 1986; Dimić, 2003; Nikolić, Ostojić i Mirić 2014). U tim radovima fokus je na rahabilitaciji oralnoga govora i kako pomoći gluhim osobama da govore. Navedene okolnosti istraživačke i stručne prakse u Srbiji inicirale su kompleksniji pristup temi koji je inkorporiran u Metodi integralnoga razvoja gluhe djece (MIRGD).

Metoda integralnoga razvoja gluhe djece (MIRGD) - općenito

U našoj je sredini krajem devedesetih godina, u okviru Centra za integralni razvoj gluhe djece u Beogradu, razvijena i primijenjena Metoda integralnoga razvoja gluhe djece (Radoman i Nikolić, 2000a; 2000b; 2013) kojom se ciljalo na stimulaciju i unaprjeđivanje onih područja u kojima gluha djeca pokazuju teškoće.

Metoda integralnoga razvoja predstavlja eklektički spoj suvremenih teorijskih spoznaja i iskustava stečenih u praktičnom netradicionalnom pristupu radu s gluhom djecom. Metoda se oslanja na kognitivno razvojnu teoriju Jeana Piageta (Phillips, 1969; Piaget, 1968; Piaget i Inhelder, 1986), i radove psihologa Hansa Furtha (1966; 1971), kulturno-povijesnu teoriju Lava Vigotskog (1996), filozofiju simboličkih oblika Hansa Cassirera (Cassirer, 1978) i humanističko egzistencijalističke teorije ličnosti. Također, metoda se oslanja na empirijske rezultate iz psihologije gluhih (Levine, 1981; Marschark, 1993; Živkovic, 1996; Radoman, 2005; Radoman i Nikolić, 2013) koji ukazuju na područja razvoja u kojima gluha djeca imaju teškoće (konzervacija, apstraktno mišljenje, nedovoljna kreativnost, snižena motivacija, nisko samopoštovanje itd.), zatim područja razvoja koja su adekvatno ili iznadprosječno razvijena (detaljna vizualna percepcija, pamćenje pokreta, određeni aspekti neverbalne inteligencije itd.) kao i na rezultate o značaju znakovnoga jezika i bilingvalnoga pristupa za kognitivni i komunikativni razvoj te djece (Bench,1993).

Metodom integralnoga razvoja potiče se razvoj važnih područja kod gluhe djece kao što su kognitivni, jezični, komunikativni, obrazovni, kreativni, emocionalno-socijalni i konativni razvoj (Radoman i Nikolic, 2000b; Nikolic, 2009; Radoman i Nikolic, 2013). Stimulacija ovih razvojnih aspekata postiže se grupnim i radioničkim radom koji koristi igru, pokret, dramatizaciju, smijeh, rješavanje zanimljivih zadataka i grupnih problemskih situacija. Rad s gluhom djecom odvija se kroz kognitivnu, komunikativnu, kreativnu i dramsku radionicu, a rad s roditeljima i širom društvenom zajednicom kroz radionicu za rad s roditeljima i radionicu za rad s širom društvenom zajednicom u skladu sa socijalnim modelom koji inzistira na uklanjanju društvenih barijera i modeliranju okruženja prikladnog za osobe s teškoćama u razvoju (Radoman, 2011; Radoman i Nikolic, 2013).

Kognitivni se razvoj potiče igrama i zadatcima koji su temeljeni na Piagetovim principima i zahtijevaju mentalne operacije klasifikacije, permutacije, konzervacije itd. Koriste se kako verbalni tako i neverbalni modeli za razvoj pojmova i apstraktnoga mišljenja. Verbalni modeli koriste se za razvoj određenih faza formiranja pojma baziranoga na teoriji Vigotskog.

Komunikativni se razvoj potiče razvojem srpskog znakovnog jezika, daktilologije, bilingvalnom metodom (oralna i znakovni zajedno) i metodom totalne komunikacije koja uključuje sve komunikacijske forme od znaka i crteža do čitanja s usana, govora i pisanja (Stokoe, 2005; Reagan, 2010). Verbotonalna metoda Petara Guberine (1972, 2010) koristi se poglavito kao pristup koji vodi računa o suprasegmentalnim karakteristikama u razvoju oralnoga govora, kao što su intonacija, dinamika, tempo, glazba i pokret kao vid motoričke kontrole pri govoru (Dulčić, 2018). Taj pristup preuzet je kao platforma i za usvajanje znakovnoga jezika. To konkretno znači da se znakovni jezik u komunikativnoj radionici usvajao uz prateće oblike podrške u razumijevanju komunikacije. Kao prirodni prateći oblici znakovnoga jezika su: prirodna gesta, izraz lica, pokret, prostor (kao vid prozodijske platforme za znakovni jezik). Širi okvir za postavku Metode integralnoga razvoja gluhe djece predstavljaju temeljne odrednice Svjetske federacije gluhih (WFD) o važnosti srpskog znakovnoga jezika koji je u praksi dugo potiskivan (čak zabranjivan gluhoj deci). Njihove preporuke odnose se na priznavanje i primjenu znakovnoga jezika što uključuje poštivanje kulture i identiteta gluhih osoba kao i zalaganje za bilingvalno i cjeloživotno obrazovanje na znakovnom i govornom/oralom jeziku (Timmermans, 2005).

Metoda integralnoga razvoja zasniva se na primjeni elemenata umjetničkih aktivnosti kao što su slikanje, drama, crtanje, igra, ples, kazalište i sl. Rezultati nekih istraživanja ukazuju na pozitivni utjecaj aktivnosti unutar umjetničkih djelatnosti u različitim područjima psihosocijalnoga funkcioniranja (Miholić & Martinec, 2013).

Kreativni razvoj potiče se kroz igru, ples, likovno izražavanje, rad na keramici, krojenju i šivanju. Primjera radi, u dramskim radionicama djeca su uključena u igrokaze, pantomimu, ples, vibrotaktilni osjet glazbe, itd. Djeca se uživljavaju u dramske likove i likove iz stvarnoga života te dramatiziraju određene situacije iz svoje školske i obiteljske svakodnevice i glume likove na zadanu temu. Tako upoznaju bolje sebe i svoje okruženje, a sve aktivnosti pored kreativnih aspekata razvijaju i socijalne vještine. Treba naglasiti da nisu svi prikazani modaliteti MIRDG-a primijenjeni u ovim istraživanjima, već samo utjecaj neverbalnih stimulacija (studija 1) i srpskog znakovnog jezika (studija 2).

Istraživanje

Empirijsko istraživanje ovoga rada odvijalo se kroz dvije različite studije koje su uključivale samo određene segmente MIRDG-a i to u vidu kognitivnih neverbalnih stimulacija (studija 1) i primjene srpskog znakovnog jezika (studija 2). Istraživanja su realizirana u dvije škole za gluhu djecu: jedna u Zemunu - „Radivoj Popović", druga u

Beogradu – „Stefan Dečanski", dok je koncepcija istraživanja pripremljena u Centru za integralni razvoj gluhe dece. Ciljevi istraživanja bili su: 1. Ispitivanje učinkovitosti sustavno primijenjenih neverbalnih oblika rada i njihova utjecaja na kognitivni razvoj; 2. Ispitivanje učinkovitosti znakovnoga jezika i njegova utjecaja na komunikaciju i obrazovanje gluhe djece. Istraživanja su provedena u različitim razdobljima, po pet mjeseci, u kognitivnoj radionici i komunikativnoj radionici. Radionice su vodili voditeljii koji su posebno osposobljeni za implementaciju metode. Voditelje su pripremili autori metode, a edukacija je uključila teorijske osnove metode kao i stjecanje praktičnih vještina potrebnih za vođenje radionica. Treba naglasiti da voditelji nisu bili upoznati s očekivanim ishodima radionica, dok su autori metode u kontinuitetu nadgledali implementaciju aktivnosti na obje studije. Također, važno je napomenuti da nisu ista djeca sudjelovala u studijijama 1 i 2. Konačno, vremenska distanca između istraživanja u okviru studije 1 i studije 2 bila je dvije godine. Potencijalni sudionici istraživanja testirani su i na osnovi rezultata podijeljeni u kontrolnu i eksperimentalnu grupu. Ispitanici su ujednačeni na temelju ostvarenih rezultata na testovima, u odnosu na dob, spol kao i stupanj oštećenja sluha. Nakon podjele ispitanika, izjednačenost grupa bila je statistički potvrđena. Tijekom istraživanja, članovi kontrolne grupe nisu bili upoznati s radionicama koje su realizirane uglavnom u drugoj školi, u popodnevnim satima nakon predavanja.

Znanstvena i istraživačka shema koja se primjenjivala u obje studije predstavlja eksperiment s paralelnim grupama. U istraživanju su korištene samo dvije tehnike MIRGD: tehnika neverbalne stimulacije kognitivnoga razvoja (studija 1) i tehnika sustavne primjene znakovnoga jezika (studija 2).

Instrumenti

U prvoj studiji je korišten Piagetov test za ispitivanje kognitivnih sposobnosti (studija 1), a u drugoj studiji (studija 2) Skala komunikativnih sposobnosti (SKS). Hisky Nebraska test i REWISK (neverbalna skala) korišteni su zbog inicijalnoga izjednačavanja kontrolne i eksperimentalne grupe. Testiranja su obavili psiholozi, koautori na ovom radu. Samo testiranje obavljeno je u uredu psihološke službe izabranih škola. Radi ispitivanja utjecaja na odabrane varijable u studiji 1, korišteni su instrumenti koje je prikazao Phillips (1966) koji je i opisao način za procjenu neverbalnih kognitivnih sposobnosti. U studiji 2 korištena je SKS koju su kreirali autori ovoga rada, a čiji prikaz slijedi. Testovi su primjenjivani individualno u trajanju od 60 minuta po ispitaniku. Upute koje su ispitivači davali tijekom testiranja predstavljali su kombinaciju standardnih tehnika zasnovanih na korištenju oralnih i znakovnih naputaka uz paralenu ponudu pisanih instrukcija.

Piagetov test kognitivnih sposobnosti (studija 1)

Prema Piagetu, period konkretnih operacija kojima se bavi ovaj test, obuhvaća kronološku dob od 7 do 11 godina. Testom se utvrđuje je li ispitanik prešao iz preoperacionalne faze u operacionalnu i je li savladao sve misaone komponente koje obilježavaju operacionalnu fazu (riješenost testa 90 % - 100 %) a samim time i stekao

spremnost za ulazak u fazu formalnih operacija. Pijagetov kognitivni test sastoji se od šest podtestova: Klasifikacija matrice - sadrži dva zadatka; Konzervacija težine - pet zadataka; Konzervacija volumena - pet zadataka; Horizontalne predstave - sedam zadataka; Vjerojatnost - deset zadataka, Odnos veličina - dva zadatka. Svaki podtest ima sedam razina za ocjenjivanje, a maksimalan broj bodova na testu iznosi 32.

Skala komunikativnih sposobnosti (studija 2)

Skala komunikativnih sposobnosti (SKS) koju su dizajnirale Radoman i Nikolić (2000a) predstavlja instrument za procjenu globalne razine komunikacijskih sposobnosti gluhe djece. Međutim, SKS testira i posebne oblike komunikacije kroz tri parametra.

Prvi parametar ispituje govorne komunikacijske sposobnosti kroz dvije podskale testa standardiziranim zadatcima. Prva podskala ispituje sposobnosti oralnoga govora, pisanja i čitanja. Druga podskala ispituje sposobnosti komunikacije na znakovnom jeziku. Rezultati obje skale čine kvantitativni pokazatelj sveukupne komunikacije gluhe djece.

Druga dimenzija skale uključuje receptivnu i ekspresivnu razinu kroz četiri podskale. Prva ispituje receptivne sposobnosti oralnog govora, razumijevanja napisanoga materijala i pročitanoga materijala. Drugi podtest ispituje ekspresivne sposobnosti oralnoga govora, pisanja i čitanja. Treći podtest ispituje receptivne sposobnosti razumijevanja znakovnog jezika (riječi i rečenice), dok četvrti podtest ispituje ekspresivne sposobnosti ispitanika na znakovnom jeziku.

Treća dimenzija Skale odnosi se na segmentnu jezičnu strukturu u kojoj su zastupljeni: riječ, rečenica i diskurs, kao i s njima odgovarajući, odnosno, podudarni znak, znakovna rečenica i znakovni diskurs.

Pouzdanost testa određena je Krombahovim alfa-koeficijentom i pokazalo se da je pouzdanost skale izuzetno visoka, iznosi 0.973.

Diskriminativnost skale SKS je analizirana odstupanjem od normalne raspodjele rezultata. Učinjen je Kolmogorov-Smirnov test uz Lilieforsovu korekciju i pokazalo se da raspodjela rezultata na skali SKS ne odstupa značajno od normalne raspodjele, što ukazuje na dobru diskriminativnost skale.

Tablica 1.

Iako analiza pokazuje da je raspodjela slična normalnoj, vidimo da koeficijent izduženosti, *kurotzis,* odstupa od uobičajenih granica, tj. da je povišen prema negativnim rezultatima, što ukazuje na blagu platokurtičnost skale SKS, odnosno povišenu diskriminativnost. Koeficijent zakrivljenosti, *skjunes,* u dozvoljenim je granicama (Nikolić, 2014).

Instrumenti za izjednačivanje grupa

U studiji 1 korišten je Hiskey-Nebraska test za ispitivanje sposobnosti učenja. Test se smatra vrlo povoljnim za ispitivanje neverbalne intiligencije kod nagluhe i gluhe djece. Pouzdanost testa dobiva se metodom „split-half" i Spearman-Brownovom formulom

predviđanja. Koeficijent pouzdanosti testa je 0.96 (Nikolić, 2014). S ciljem ujednačavanja grupa, ispitanici su testirani neverbalnom skalom REWISK-a, standardiziranom i adaptiranom za djecu s teškoćama u razvoju u našoj sredini (Hrnjica i sur., 1991), s normama dobivenim za djecu oštećenoga sluha. Pouzdanost ove verzije testa iznosila je 0,75–0,93 za pojedine podtestove. Zadatci u podtestovima su: Dopuna, Sklapanje figura, Kosove kocke, Šifra i Strip.

Studija br.1.(kognitivna radionica)

Empirijski rezultati iz psihologije gluhih (Furth, 1966) pokazali su zaostajanje gluhe djece u preoperacionalnoj fazi i odgođen razvoj faze konkretnih operacija, posebno konzervacije koja kasni čak i do petnaeste godine.

Ovo istraživanje imalo je za cilj eksperimentalnu provjeru vrijednosti i učinkovitosti sustavne primjene tehnika neverbalnoga rada s gluhom djecom za ubrzavanje i unaprjeđivanje njihova kognitivnoga razvoja u razdoblju konkretnih operacija. Eksperimentalna i kontrolna grupa izjednačene su prije početka eksperimenta izjednačene s obzirom na stupanj oštećenja sluha, inteligencije, uzrasta i spola, a zatim, prije i poslije eksperimenta testirane Piagetovim testom kognitivnih sposobnosti.

Programski sadržaj kognitivne radionice, koju je prošla samo eksperimentalna grupa, bio je baziran na različitim oblicima neverbalne stimulacije i komunikacije pokretom, na neverbalnim igrama, crtanju, rješavanju neverbalnih problemskih situacija i zadataka usmjerenih na stimulaciju i razvoj vizualne percepcije, pažnje, pamćenja, psihomotorike i logičkih operacija karakterističnih za operacionalni period i period formalnih operacija.

Osnovu su činile neverbalne tehnike razvijene od Wolfa i Spolinove u Furthovoj laboratoriji mišljenja za gluhu djecu (Furth 1971), donekle modificiranu i obogaćenu od strane Radoman i Nikolić (2000b). Pretpostavke u ovom eksperimentu bile su da će gluhi ispitanici eksperimentalne grupe, nakon petomjesečnoga, svakodnevnog, polusatnog, angažiranja u kognitivnoj neverbalnoj radionici, ostvariti statistički značajno viša kognitivna postignuća od kontrolne grupe gluhih na zadatcima Piagetova testa, koji ispituje operacije klasifikacije i serijacije konzervacije težine i volumena, zatim usvajanje horizontalnih predstava, shvaćanje pojma vjerojatnosti i odnosa veličina.

Metoda (studija 1)

Uzorak

U istraživanju br. 1 uzorak je činilo 50 ispitanika podijeljenih u eksperimentalnu (25) i kontrolnu grupu (25). Kronološka dob djece bila je od 8 do 12 godina, izjednačena po stupnju oštećenja sluha (izraženoga u dB), inteligenciji (Hisky-Nebraska test za gluhu djecu), po spolu i dobi, a nakon inicijalnoga testiranja Piagetovim testom i na osnovi kognitivnih sposobnosti (tablica 2).

Tablica 2.

Istraživački postupak

Koncept istraživanja

Studija ili istraživanje br.1 oslanja se na Furthov model kognitivnih radionica koje su prikazane u njegovoj knjizi *Mišljenje bez jezika - psihološke implikacije gluhoće* (Furth 1966). U svojem radu, Furth je pokazao da kognitivni razvoj ne ovisi isključivo o jeziku (bar ne u početnoj fazi kognitivnoga razvoja) kao i da su neverbalni oblici kognitivne stimulacije prikladniji za gluhu djecu u razvojnom periodu.

Sudionici u našem istraživanju posjećivali su kognitivnu radionicu pet puta tjedno. Djeca su bila raspoređena u četiri grupe s maksimalnim brojem do šestero djece. Aktivnosti su vodili prethodno osposobljeni voditelji.

Prikaz aktivnosti unutar kognitivne radionice

Sadržaji aktivnosti kognitivne radionice pripremljeni su u skladu s razinom dječjih interesa i sposobnosti. U okviru radioničkih aktivnosti uvježbavale su se, stimulirale i razvijale sljedeće sposobnosti: motoričke, opažanje, logika i stvaralaštvo. Aktivnosti u radionici prilagođene su mogućnostima, interesima i potrebama gluhe djece s posebnim naglaskom na poticaj i razvoj vizualne percepcije, vizualne pažnje i pamćenja, logičkih operacija karakterističnih za period formalnih operacija i svih oblika neverbalnoga izražavanja.

Aktivnosti koje su se odvijale u radionicama grupirane su na sljedeći način: vježbe klasifikacije, vježbe otkrivanja 'muster'uzorka, vježbe vjerojatnosti, vježbe perspektive, igra uloga s ciljem poticanja razvoja motorike, opažanja, logike i stvaralaštva.

Motoričke sposobnosti. Kognitivna radionica uključuje sve oblike kretanja, od hodanja, trčanja, skakanja, bacanja, hvatanja i održavanja ravnoteže do finih motoričkih radnji nizanja perli, slaganja kockica, pletenja itd. Ove vježbe razvijaju makro i mikro motoričke sposobnosti gluhoga djeteta što čini dobru podlogu za razvoj kognitivnih operacija.

Opažanje je važno za brzu adaptaciju i snalaženje u novim situacijama i problemima. Zadatci koji naglašavaju važnost opažanja zahtijevaju od djece da uoče promjene na promatranom uzorku te povezuju slično i različito. To, svakako, nisu igre pasivnoga promatranja jer u njima dolazi do izražaja stvaralaštvo i elementi konstruktivnosti.

Logika. Shvaćanje složene ideje podrazumijeva stvaranje hipoteze i rješavanje problema. Logičke igre kao što su: klasifikacija, serijacija, operacija brojevima itd. djeci pomažu da lakše poredaju, razlikuju, procijene i izdvoje bitno od nebitnoga. Logičke igre omogućuju djetetu da uči kroz vlastitu intelektualnu aktivnost.

Stvaralaštvo. Kreativna igra je put prema pojmovnom i simboličkom načinu razmišljanja. Termin "stvaralačka igra" označava igre koje dijete samo kreira, dopunjuje i sadržajno mijenja. Igre se izvode bez ikakve prinude, već samoinicijativno i sa zanimanjem.

Motivacija se poticala zanimljivim materijalom za igru, u bojama i oblicima koji su bliski dječjim interesima. Presvlačenje, kostimi, razni rekviziti i crteži korišteni u radionicama motivirali su djecu za intelektualni rad.

Analiza rezultata

Tijekom istraživačke faze prvo je provedeno inicijalno testiranje Piagetovim testom kognitivnih sposobnosti, nakon čega su, samo članovi eksperimentalne grupe sudjelovali u neverbalnim kognitivnim radionicama u periodu od pet meseci. Članovi kontrolne grupe u tom periodu nisu bili uključeni u radionične aktivnosti. Nakon radioničnih aktivnosti članovi obje grupe su posteksperimentalno testirane Piagetovim kognitivnim testom, a razlike u rezultatima grupa su bile predmet analize. Razina značajnosti bila je $p < .05$.

Rezultati (studija 1)

Težište u analizi rezultata bilo je na određivanju veličina učinka (d) , koja se najčešće koristi kada je nezavisna varijabla dihotomna, a zavisna varijabla kontinuirana, što je u našoj studiji bio slučaj - nezavisna varijabla je grupa, a zavisna varijabla je test/ podtest rezultat.

Tablica 3.

Tablica 3 pokazuje da postoje statistički značajne razlike s obzirom na kognitivnu razvijenost na ukupnom Piagetovu testu ($t = 2,58$, $p = 0,0169$) kod ispitanika eksperimentalne grupe na testu i retestu (prije i poslije provedenih kognitivnih radionica). Ovaj rezultat potvrđuje da su neverbalne stimulacije bile učinkovite za kognitivni razvoj i ovladavanje konkretnim operacijama u mišljenju. Kao što veličina učinka pokazuje (tj. praktični učinak dobivenih rezultata), on je veoma visok ($d = 1,86$).

Dobivene su statističke značajne razlike između test i retest skorova ispitanika koji su rješavali zadatak konzervacije zapremine ($t = 4,57$ $p = 0,0003$). Naime, veličina učinka je bila 1,06 što ukazuje na vrlo visok učinak.

Dobivene su statistički značajne razlike između test i retest skorova ispitanika koji su rješavali zadatke s horizontalnim predstavama ($t = 2,90$ $p = 0,0123$), gdje je veličina učinka bila 0,99, što ukazuje na vrlo visok učinak.

Dobivene su statistički značajne razlike između test i retest skorova ispitanika koji su rješavali zadatke s ordinalnim odnosima ($t = 2,58$, $p = 0,0169$) gdje je veličina učinka bila je 0,74 što ukazuje na srednji (tipičan) učinak.

Tablica 4.

Tablica 4 pokazuje da se pojavila statistički značajna razlika u kognitivnoj razvijenosti na cjelokupnom Piagetovu testu ($t = 4,3$, $p = 0,0008$). Ovaj rezultat potvrđuje da je neverbalna stimulacija bila učinkovita za kognitivni razvoj i svladavanje konkretnim operacijama. Kao što veličina učinka pokazuje (tj. praktični učinak dobivenih rezultata), on je vrlo visok ($d = 1,24$). Javile su se također statistički značajne razlike između ispitanika eksperimentalne i kontrolne grupe na retestu kod zadatka konzervacije težine ($t = 3,15$ $p = 0,0029$) gdje je veličina učinka bila 1,06 što ukazuje na vrlo visok učinak. Pojavile su se također statistički značajne razlike između ispitanika eksperimentalne

i kontrolne grupe na zadatcima s vjerojatnošću (t = 2,39 p = 0,0210) čija je veličina učinka bila 0,70 što ukazuje na srednji (tipičan) učinak.

Također su se pojavile statistički značajne razlike između ispitanika eksperimentalne i kontrolne grupe na retestu kod zadataka s ordinalnim relacijama (t = 2,48 p = 0,0169) čija je veličina učinka bila 0,71 što ukazuje na srednji (tipičan) učinak. Konačno, ako govorimo o individualnim postignućima ispitanika eksperimentalne grupe, pretpostavljamo da se sporiji napredak nekih ispitanika ove grupe može objasniti fluktuacijom pažnje kao i slabijom motivacijom u završnom testiranju.

Studija 2 (komunikativna radionica)

Svrha ovoga istraživanja je provjera utjecaja i sustavne primjene znakovnoga jezika na srpski oralni/govorni jezik (na receptivnoj i ekspresivnoj razini) kao i na ukupnu komunikacijsku razinu i školski uspjeh. U materijalu koji objašanjava gramatiku talijanskoga znakovnog jezika istaknuto je da ono što se u vokalnom jeziku potiče prijedlozima, veznicima i promjenom riječi, to se u jeziku znakova postiže davanjem funkcionalnoga značaja prostoru koji okružuje sugovornike, kao i pokretu koji zajedno povezuje više elemenata u jedinstveni znak (Teruggy, 2003).

Naša je hipoteza bila da će se postići kohezija između srpskog znakovnoga jezika i srpskog oralnoga jezika, čime bi se poboljšalo i školsko postignuće. Eksperimentalna i kontrolna grupa inicijalno su izjednačene s obzirom na stupanj oštećenja sluha, kognitivne sposobnosti, školski uspjeh, dob i spol. Prije i nakon eksperimenta grupe testirane su Skalom komunikacijske sposobnosti za gluhu djecu. Komunikacijska radionica za učenje gluhe djece srpskom znakovnom jeziku (SZJ) trajala je pet mjeseci. Djeca eksperimentalne grupe svakodnevno su provodila 45 minuta (jedan školski sat) u usvajanju više od 300 pojmova iz neposrednoga okruženja na SZJ uz vježbe formiranja rečenice na znakovnom jeziku kroz igru, zanimljive zadatke i grupne situacije. U tim aktivnostima djeca su koristila *Početnicu znakovnoga jezika* i prateću vježbenicu.

Metoda (studija 2)

Uzorak

Uzorak studije 2 uključuje 60 gluhih ispitanika raspoređenih u eksperimentalnu grupu (30) i kontrolnu grupu (30). Grupe uključuju djecu kronološke dobi od 8 do 12 godina i svaka grupa ima jednak broj dječaka i djevojčica. Djeca imaju približno jednak audiološki status kao i rezultate na neverbalnoj skali REWISK testa, Skali komunikativnih sposobnosti, kao i ujednačenost školskih postignuća prikazanih prosječnim ocjenama (tablica 5).

Tablica 5.

Istraživački postupci

Studija br. 2 je podrazumijevala uključivanje Komunikacijske radionice kao dio svakodnevnih školskih aktivnosti samo za ispitanike eksperimentalne grupe, u

trajanju od pet mjeseci. Na početku istraživanja svi ispitanici raspoređeni u kontrolnu i eksperimentalnu grupu inicijalno su testirni Skalom komunikacijskih sposobnosti i REWISK-om čime se finalizirala konačna određenost kojoj grupi će ispitanici pripasti. Važno je naglasiti da su svi sudionici u istraživanju, članovi eksperimentalne i kontrolne grupe, učenici škola za gluhe učenike u kojima se znakovni jezik ne uči i ne koristi kao jezik na kome se predaju nastavni predmeti. Svi sudionici su imali priliku upoznati se sa znakovnim jezikom (najčešće stariji učenici škole), ali ne kao vidom sustavnoga učenja, što se i pokazalo na inicijalnim rezultatima SKS, testa korištenim za ujednačavanje grupa. Pored toga, prikupljeni su podatci o školskim postignućima ispitanika koje su imali prije početka eksperimenta.

Članovi eksperimentalne grupe podijeljeni su u šast podgrupa s maksimalno pet članova. Svaki član eksperimentalne grupe posjećivao je komunikacijsku radionicu pet puta tjedno, tako da je ukupan broj realiziranih radionica iznosio 100 za svakog ispitanika eksperimentalne grupe.

Završna faza istraživanja trajala je mjesec dana. U tom razdoblju svi ispitanici eksperimentalne i kontrolne grupe bili su retestirani Skalom komunikacijskih sposobnost, a također su prikupljeni podatci o školskom uspjehu svih ipitanika na kraju školske godine. Statistička obrada podataka podrazumijevala je uspoređivanje rezultata eksperimentalne i kontrolne grupe.

Prikaz aktivnosti unutar komunikacijske radionice

Komunikacijska radionica oslanja se na aktivnosti koje je osmislio Hans Furth i primijenio 1970. godine u školi u Zapadnoj Virginiji (Nikolić,2009). Centar za integralni razvoj gluhe djece iz Beograda prilagodio je i osuvremenio koncept komunikacijskih radionica koji je bio primijenjen u Zapadnoj Virginiji. Za potrebe studije 2., kao radionički edukativni material, korišteni su *Početnica znakovnog jezika i Vežbenica znakovnog jezika* (koje su izradile autorice istraživanja). *Početnica znakovnog jezika* sadrži 300 pojmova grupiranih u deset tematskih područja (priroda, obitelj, škola, kuća, grad, selo, komunikacija, raspoloženje, osjećaji i apstraktni pojmovi). Svaki pojam prikazan je crtežom kao i znakom koji ga predstavlja, dok je naziv pojma imenovan pisanim putem. *Vežbenica za znakovni jezik* sadrži 100 vježbi i zadataka i sadržajem prati *Početnicu znakovnog jezika* (Radoman i Nikolić, 2013).

Metoda rada u komunikacijskoj radionici obilježava pristup postupnosti (od poznatog ka nepoznatom) kao i princip bihejvioralnoga potkrepljenja. Radionički zadatci i igre koncipirani su tako da omoguće postupno svladavanje pojedinačnih znakova za određene referentne pojmove (koji su predstavljeni uživo, kao i crtežima i fotografijama), nakon čega su usvojeni znakovi kombinirani u znakovne sintagme i na kraju u tematski diskurs. Pojedinačni znakovi i sintaksa potom su korišteni u komunikacijskoj situaciji, dijadne ili poliadne komunikacije s članovima grupe, čime je uvježbavana ekspresivna i receptivna znakovna razina za svaku tematsku cjelinu. Ispitanici eksperimentalne grupe kroz deset tematskih cjelina prikazanih u *Početnici* najprije su usvajali znakove za pojedinačne pojmove, čime je progresivno uvećavano i

proširivano razumijevanje značenja situacija prikazanih pomoću znakovnih sintagmi i znakovnih rečenica. Nakon usvajanja receptivne znakovne razine oni su bili osposobljeni za ekspresivnu znakovnu produkciju i međusobnu znakovnu komunikaciju. Voditelje radionica educirali su autori programa *Početnica* i *Vežbenica za znakovni jezik*.

Rezultati (studija 2)

U studiji 2 naglasak je, također, na testiranju veličine učinka (d) kao i na Pirsonovom koeficijentu korelacije. Distribucija odgovora na podskalama je normalna zato što se skjunes i kurtozis kreću od -2 do +2 (George i Mallery, 2010). Veličina učinka (d) odnosi se više na veličinu razlike nego na jačinu povezanosti između dvije varijable, kao što je to slučaj kod Pirsonova koeficijenta korelacije.

Tablica 6.

Tablica 6 pokazuje da se pojavila statistički značajna razlika ($p < 0,01$) u globalnoj komunikacijskoj sposobnosti ($t = 9,51$, $p = 0,000$) kod ispitanika eksperimentalne grupe između testa i retesta (prije i poslije komunikacijskih radionica). Veličina učinka (tj. praktična značajnost dobijenoga rezultata) jako je visoka ($d = 2,46$) čak i viša nego što je to uobičajeno.

Dobivena je statistički značajna razlika ($p < 0.01$) između testa i retesta eksperimentalne grupe na svim podtestovima koji procjenjuju verbalnu ekspresivnu sposobnost pisanja i verbalnu receptivnu sposobnost pisanja s izuzetkom podtesta 14. Dobivena je neuobičajeno visoka razina veličine učinka na podtestu 3 ($d = 2,04$) i podtestu 13 ($d = 2.01$).

Na svim ostalim podtestovima bila je također visoka vrijednost učinka ($d > 1$), iako nešto niža u odnosu na spomenuti podtest 3 i podtest 13. Samo neki od ispitanika pokazali su niže testovne rezultate za koje je možda mogući razlog veća fluktuacija pažnje i slabija motivacija.

Tablica 7.

Tablica 7 pokazuje sstatistički značajnu razliku na retestu na globalnoj Skali komunikacijskih sposobnosti između ispitanika kontrolne i eksperimentalne grupe koja je bila uključena u komunikacijske radionice na dnevnoj bazi. Veličina učinka (koja pokazuje praktičnu značajnost dobivenoga rezultata) vrlo je visoka ($d = 2.08$), ustvari je viša nego što je uobičajeno.

Eksperimentalna grupa također je napravila statistički značajan napredak u usporedbi s kontrolnom grupom ($p = 0,01$) na retestu, na svim podtestovima koji procjenjuju verbalne ekspresivne i verbalne receptivne sposobnosti pisanja, posebno na podtestovima 3 i 13 gdje je dobivena neuobičajeno visoka vrijednost učinka ($d = 2,17$ i $d = 2,01$). Visoki je učinak postignut, iako niži nego na dva prethodno spomenuta podtesta, na podtestu 1 ($d = 1,10$), podtestu 2 ($d = 1.49$), podtestu 5 ($d = 1,24$), podtestu 6 ($d = 1,24$), podtestu 7 ($d = 1,66$), podtestu 8 ($d = 1,55$), podtestu 9 ($d = 1,40$), podtestu 10 ($d = 1,31$), podtestu 11 ($d = 1,59$) i podtestu 12 ($d = 1,10$). Na podtestu 4 dobiven

je srednji (tipičan) učinak (d = 0,69), dok je na podtestu 14 vrlo nizak učinak (d = -0,03), ustvari značajno niži nego što je očekivano.

Tablica 8.

Školski uspjeh eksperimentalne grupe (izražen prosječnom ocjenom) bio je statistički značajno različit od školskoga uspjeha kontrolne grupe (t = 3,415 df = 58).

Ovo znači da su ispitanici eksperimentalne grupe nakon provođenja komunikacijskih radionica pokazali bolje školsko postignuće od ispitanika kontrolne grupe. Veličina učinka je visoka (d = 0,88).

Tablica 9.

Diskusija

Pitanje je zašto određeni broj relevantne znanstvene literature pokazuje da gluha djeca imaju nižu razinu akademskoga postignuća nego njihovi čujući vršnjaci (DeLana, Gentry, i Andrews, 2007; Marschark, Shaver, Nagle i Newman, 2015). Njihovo akademsko postignuće predstavlja rezultat složenoga uzajamnog djelovanja mnogih čimbenika koji, prema Marscharku i Spenceru (2003), uključuju karakteristike učenika (npr. prag slušanja, jezičnu fluentnost, model komunikacije i komunikacijsko funkcioniranje), karakteristike njihovoga obiteljskog okruženja (npr. akademska razina roditelja, socio-ekonomski status) teiskustva u školi i izvan nje. Programi kognitivne akceleracije u nekoliko stotina redovnih škola širom svijeta (Matejić-Đuričić i Stojković, 2011) pokazali su napredak učenika na zadatcima koji zahtijevaju razine konkretnih operacija i razine formalnih operacija prema Piagetovoj teoriji. Štoviše, učenici su pokazali viša ukupna školska postignuća, posebice iz matematike. Rezultati studije 1 također su potvrdili uspjeh neverbalnih tehnika prilagođenih gluhoj djeci, koje smo primijenili u tom istraživanju, da bi se postigla kognitivna akceleracija i bolji školski rezultati. Također, Wellman i Peterson (2013) navode da je usvajanje jezika i razumljivoga govora i/ili pisane komunikacije od ranoga djetinjstva ključno za razvoj kognicije i urednoga razvoja. Djeca sa zaostajanjem u jezičmom razvoju i osiromašenim komunikacijskim interakcijama značajno zaostaju u nekoliko apsekata verbalnoga i neverbalnoga razvoja. Rezultati ovoga istraživanja pokazuju da sustavna primjena neverbalne komunikacije, kao što su kognitivni zadatci, igre i vježbe, značajno unaprjeđuju pojedine logičke operacije karakteristične za operacionalni period – stadij konkretnih logičkih operacija (Furth, 1966; Meadow,1968; Radoman i Nikolić, 2000b, Courtin, 2000; Wellnam i Peterson, 2013). Rasprave o znakovnom jeziku pokazuju da i danas postoji nedostatak sustavne podrške za razvoj znakovnoga jezika, što je odraz situacije i u Republici Srbiji. U Srbiji samo 0,34 % gluhih osoba mlađih od 30 godina uspijeva započeti i završiti akademske studije (Nikolić, Lukić i Janković, 2010). U zemljama gdje je znakovni jezik prisutan i gdje postoji podrška za učenje znakovnoga jezika od rane dobi i nadalje, taj je postotakt značajno veći (Grosjean, 2001; Mahshie, 2007, Teruggy, 2003). Danski znakovni jezik i danski jezik predstavljaju službeni cilj svih škola za gluhu djecu u

toj zemlji (Engberg-Pedersen, 1993). Istraživanje profesora s Gallaudet sveučilišta za gluhu djecu na 64 % svih gluhih učenika u SAD-u, otkrilo je da su nedovoljni rezultati gluhe djece posljedica činjenice da nisu učili znakovni jezik od rane dobi (Regan, 2010). Štoviše, rezultati su pokazali da djeca koja počnu učiti znakovni jezik ranije, kognitivno, komunikacijski i socijalno funkcioniraju kao i njihovi vršnjaci. Konačno, rezultati su pokazali da učenje znakovnoga jezika olakšava učenje većinskoga jezika (Allen, 1986; Lucaus i Valli, 1989; Paul i Quigley, 1987; Reagan, 2010; Sallabank, J. 2013). Potaknuti rezultatima višegodišnjega prikupljanja znanstvenih saznanja o važnosti znakovnoga jezika u Sjedinjenim Američkim Državama, skandinavske zemlje skupile su ogroman korpus dokumentiranoga materijala u prilog znakovnoga jezika (Reagan, 2010). Kao i rezultati mnogih drugih istraživanja, studija 2 pokazala je da sustavno učenje znakovnoga jezika unaprjeđuje komunikacijske vještine kao i kurikulske ishode u svim predmetima. Osnaživanje iz područja istraživanja znakovnoga jezika u vidu relevantnih informacija tek trebaju doći. U mnogim zemljama, opis lingvističkoga sustava proizveo je promjene u ideologiji jezika i donio promjene u stavovima prema jeziku (Hill, 2015; De Clerck, 2007).

Ograničenje studije

U ovoj studiji nismo bili u mogućnosti kontrolirati eventualnu dostupnost znakovnoga jezika u situacijama u kojima su se ispitanici nalazili nezavisno od školskoga okruženja. U tom pogledu način komunikacije u obitelji ispitanika svakako je od najveće važnosti. Ipak, s obzirom na to da znakovni jezik u našoj sredini nije standardiziran i da roditelji gluhe djece nemaju sustavnu edukaciju u znakovnom jeziku, pretpostavili smo da su učinci ove varijable minimalni. Također, u studiji nismo kontrolirali slušni status roditelja koji bi također mogao biti u vezi s oblikom komunikacije u obitelji. Iz prakse nam je poznato da veoma mali broj roditelja gluhe djece također ima slušno oštećenje. S obzirom da naša studija predstavlja probni projekt u primjeni tehnika u okviru Matode integralnoga razvoja gluhe djece, preporuka je da se u budućim istraživanjima planira bolja kontrola okolinskih čimbenika, posebno izvanškolskoga okruženja, kao što je utvrđivanje dominantnoga oblika komunikacije u obitelji (koristi li se SZJ, znaju li ga roditelji, brat/sestra).

Zaključak

Metoda integralnoga razvoja za gluhu djecu razvijana je i primjenjivana godinama u praktičnom radu s gluhom djecom. U istraživanjima koja su dio ovoga rada, prikazali smo neke od tehnika ove metode koje su eksperimentalno testirane. One su inspirirane Furthovom laboratorijom mišljenja (1966) za gluhu decu, kao i radom Klima i Bellugija (1979). Ovo eksperimentalno istraživanje empirijski je verificiralo razvojne učinke primijenjenih radioničnih tehnika razvijenih unutar Metode integralnoga razvoja za gluhu djecu. Buduća istraživanja trebala bi proširiti primjenu Metode integralnoga razvoja za gluhu djecu na mlađu gluhu djecu (što zahtijeva implicitne modifikacije

tehnike) kako bi se vidjelo jesu li učinci ove metode bolji kada se primijene u ranom razdoblju, što se može i očekivati. Štoviše, buduća istraživanja trebala bi ispitati učinke kod djece s kombiniranim teškoćama i različitim stupnjevima oštećenja sluha. Ponavljane studije na sličnim uzorcima, ali i primjena Metode na većim uzorcima, pružit će nove empirijske dokaze i, vjerujemo, dati nove argumente za praktičnu primjenu našega pristupa. Konačno, trenutačna situacija ukazuje na neophodnost pripremanja sveobuhvatne strategije za srpski znakovni jezik i usklađivanje s međunarodim dokumentima i preporukama.