EDUCATIONAL INTEGRATION OF HEARING IMPAIRED CHILDREN INTO A PRIMARY REGULAR SCHOOL: PROJECT EVALUATION

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In Slovenia we can find different levels of implementation of integration forms into the teaching practice, both regarding the strategies of integration as well as professional and financial solutions. The present article introduces the project of Integration of Hearing Impaired Children into a Regular Primary School in Maribor, currently running under the supervision of the Slovene Board of Education and Sport. The project of Integration did not lead to any negative effects on the hearing pupils of the first grade who were taught together with their hearing impaired peers. The level of their knowledge is comparable to the knowledge of the first graders with no integrated pupils. But the differences occurred among the hearing impaired pupils on their higher acquired levels of motivational, social and emotional integration.

***Keywords**: Hearing impaired children, integration, evaluation, mainstreaming*

Introduction

Slovenia recently faced some global changes - like the establishment of an independent state and the introduction of a multi-party system in particular - which led to some changes in instruction and education. The fact that we followed the recommendations of UNESCO, European Union, numerous professional, humanitarian, national and international associations, resulted in an increased integration of children with special needs into regular kindergartens, primary schools, secondary schools and also universities. The new Slovene educational legislation - Compulsory Education Law (1996) and The Law of counseling children with special needs (2000) both provide the formal legal grounds to create formal grounds for the educational integration of the children with special needs.

In Slovenia we can find different levels of implementation of integration forms into the teaching practice, both regarding the strategies of integration as well as professional and financial solutions. From the point of view of the present state of education in our country, as far as the conditions are concerned, we can say that the integration is demanding and not yet perfected at the conceptual level (Galeša, 1997, Skalar, 1999). This is the reason the integration is introduced gradually into those schools that have the required personnel, appropriate premises, financial means etc. and we do that within the framework of projects.

Researchers in numerous countries have proved that integration is very common, but there are still many obstacles that prevent both the inclusion and acceptance of children with special needs on the whole. Authors of many studies (Pijl, Meijer, 1991; Ainscow, Haile-Giorgis, 1999) emphasise the fact that it is much more demanding to accomplish (realize) social than curricular integration, and they enumerate the

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factors that impede the integration. Further, we introduce some research results from area of integration of hearing impaired children.

Forrugia and Austin (1980, cf. Heiling) compared the hearing-impaired children in special as well as in regular schools and the hearing children. They found out that hearing- impaired children who are integrated have less favourable conditions for a normal social development. Above all they lack experience in social interactions with their peers which are necessary for an appropriate social development.

The study by Aplin (1987) in England shows that the integrated hearing-impaired children from the ages of 7 to 16 are socially and emotionally more adapted than those in special schools. She attributes the differences between the two groups to appropriate adjustments for the integrated children, to the fact that the teachers know the children better, to an early diagnosis and to a complex treatment of children by additional specialists in the process of integration.

Stinson and Antia (1999) reported that deaf children in hearing schools have been found to be neglected, tend not to be chosen as friends, and receive negative nominations from their hearing peers. They also found that schools have often been described by children with special needs as unfriendly, lonely places or as a place where they are teased and ignored by other children.

Antia and Kreimeyer (1992) have investigated intervention packages for preschoolers who are deaf and hearing preschoolers for over a decade. They concluded that intervention can have positive effects when adults are willing to take considerable time and effort to plan.

Solit et al. (1992) agreed that staff training is essential to the success of integrated programming. They stated that staff members in integrated programs have mastered basic signed communication skills or the program must hire additional staff who are fluent in the modes of communication used by the children who are deaf and hard-of –hearing in their care.

Luetke-Stahlman (1994) states that general principles for promoting socialization among deaf and hearing peers include building on strengths of the children, removing barriers to linguistic accessibility, and establishing conditions that can maximize the success of social encounters by attending to children's interests, group size, and other such variables.

Luiselli and Luiselli (1995) have identified many issues related to high quality inclusive programming for children with disabilities that apply to children who are deaf-blind. These issues are 1) interventions for promoting communication-language development, 2) environmental arrangements, 3) strategies to promote social interactions and overall social competence, 4) curricular adaptations or modifications, 5) preparation and training of personnel, 6) strategies to incorporate functional skills training in inclusive settings, 7) the classroom operation and organization of classrooms, 8) administrative support and responsibilities, and 9) the availability of inclusive summer programming.

Wray, Flexer and Vaccardo (1997) evaluate the treatment efficacy of an auditory-verbal early intervention on 19 children who have severe to profound hearing losses. They were included fully in mainstream classrooms in their local schools. A standardized teacher questionnaire was used to assess the classroom performance of 19 subjects. The results indicated that the subjects' performance was strongest in school behaviour; 90% of the subjects received a pass score. The next strongest areas of subject performance were class participation and academics; 84% of the subjects received passing scores in each of these categories. In the area of attention, 74% of the subjects received passing scores. The weakest of the five areas was communication; teachers rated 42% of the subjects as passing. Wray, Flexer and Vaccardo found that students' communication skills improve over the time. Though these skills may be deemed below average from kindergarten to third grade, communication skills improve, even if they remain below average.

The results of studies investigating the attitudes of individual groups of teachers or learners towards the integration of hearing-impaired chil-

dren are very different. Uzelac (1989) for example claims that the teachers in regular primary schools have a more positive attitude towards the integration of hearing-impaired children than the learners without any problems. Those teachers believe that hearing-impaired children are equal to regular pupils without impediments in many characteristics and that the primary school can offer appropriate conditions for those children to attain the same academic achievements as regular pupils. The teachers stress particularly that this is so only in the case when these children are provided with the professional help of a defectologist or they are included in special groups or classes for particular subjects.

The research of the social status and social maturity of hearing-impaired children compared to hearing children in Slovenia (Peršolja, 1997) did not show any statistically significant differences in social integration of hearing-impaired or hearing children neither at the lower level of the primary education (classes from 1 to 4) nor at the higher level (classes from 5 to 8). The research sample included 40 pupils of which there were 20 hearing-impaired children who represent the experimental group and the remaining 20 hearing children in the control group. The two groups were equal in the division of gender, in respect of their academic achievements, as well as according to the years of education their parents received and the number of their family members. The results should not be generalized since the population of hearing-impaired children in much larger.

In his study Kuhar (1997) researched the social status of integrated hearing-impaired children in thirty primary school classes. The sample included children from the ages of 7 to 15. The results showed that the integrated children were successful in their academic achievements but they were lonelier and less liked than their hearing peers. The author states that the minority of those children (17%) was very popular but almost half of the hearing-impaired children (43%) remained lonely and unpopular in spite of thorough supervision and help from The Institution for the Training of Hearing and Speech-Impaired in Ljubljana.

Košir (2000) researched the development of mathematical skills in basic arithmetic and the use of mathematic strategies in deaf children integrated into regular primary schools who received continuous professional help during one school year (experimental group), and he compared them to a group of hearing-impaired children who stayed in the Institution (reference group) and to a group of hearing-impaired children integrated in a regular school who did not get any organized professional help (control group). He found that the command of basic arithmetic operations of the pupils in the experimental group keeps up with the command of mathematic skills of the comparable groups of deaf pupils who learn without organized help or in the Institution. Nevertheless the progress in the (development of mathematical skills) acquired knowledge of basic arithmetic operations and the use of mathematical strategies was slower/smaller than with other integrated pupils or the pupils in the Institution. The author attributes the reasons for poorer results of the experimental group to the fact that the pupils are younger, they attend a lower class of the primary school, which means less practice and a shorter time for learning. In spite of the fact that the pupils in the experimental group have the most developed mental abilities among all the groups, they also have the most frequent additional impairments which impede the utilization of otherwise good mental potentials.

This article presents the project of integrating hearing-impaired children into a regular primary school in Maribor, currently running under the supervision of *National Education Institute*. The integration of three hearing-impaired pupils was well planned. Before the beginning of the school year the team of experts from the *Centre for Hearing and Speech* organized a meeting for the headmaster and the teaching staff where they introduced those pupils, the characteristics of their functioning, and drew their attention to the key problems relevant to the communication with those pupils and to the way the teaching materials

are presented in class. The school and the *Centre for Hearing and Speech* agreed to meet on a regular basis with a representative from the *National Education Institute* who would also be present. The experts from the *Centre* offered the school continuous professional support in solving potential problems. Likewise, the pupils and their parents were acquainted with the integration of three hearing-impaired children into their regular class. A special teacher (teacher of the deaf) was presented to the pupils as the second teacher who is constantly present in the class.

The characteristics of the chosen model of integration

The Centre for Hearing and Speech in Maribor is involved in the project of integrating deaf children and children hard of hearing with their hearing peers. In the school year 1995/96 there was a partial integration of deaf and hearing impaired children into a regular class of the kindergarten within the *Centre* (the treatment of chosen topics took place three times a week); in the next year there was a complete integration in the same *Centre* (daily pre-school program); in the school year 1997/98 the project reached its final (the third) stage within which the integration of deaf and hearing impaired children into the regular primary school began. Its characteristics are the following:

- integration of **three** children (two hard of hearing and a deaf one) into the same class,
- teaching is performed by a primary **class teacher** with the constant presence of a **special teacher** or the teacher of the deaf (teaching tandem),
- individual hearing and speech therapy, musical and rhythmical stimulation of integrated children are offered at the *Centre* three times a week,
- **daily learning assistance** is organised.

Simultaneously to the implementation of this model of integrating hearing-impaired children into a regular primary school the process of evaluation is being carried out, and it developed into a summative evaluation at the end of the school year 1997/98. This article presents its contextual and methodological characteristics and findings.

The goals of evaluation

The evaluation of the project of integration of deaf and hearing impaired children into a regular primary school is based on the following goals:

1) Evaluation of integration effects in HEARING first graders from the point of view of their **academic achievement,** assessed on the basis of statistical testing of the following HYPOTHESES :

Pupils of the *experimental group* who have lessons together with integrated hearing-impaired pupils will achieve the *same results* as the *control group* of pupils without integrated children in the area of :

H1: linguistic skills – knowledge of the Slovene language
H1.1: reading comprehension
H1.2: dictation (writing)
H2: mathematical skills – achievement in mathematics

We included the hearing peers into the research as the control group because we were interested in finding out whether the project of integration will cause any negative effects on the hearing classmates in the experimental group.

2) Evaluation of integration effects in HEARING-IMPAIRED first graders in the broader sense, i.e. from the aspect of **academic achievement** in linguistic and mathematical skills, **emotional** and **social integration** of hearing-impaired children in a regular primary

school, on the basis of the analysis of differences between the *integrated* pupils *as individuals* and the analysis of differences between *integrated pupils as a group*, on the one hand, and the experimental group of hearing pupils on the other. There are namely such differences among the integrated pupils that the calculated common parameter (e.g. mean value) is but a poor representative and as such inappropriate for further investigation, in our case statistic testing of the differences between the group of hearing and the group of integrated hearing-impaired pupils without statistical testing.

Methodological characteristics of the evaluation

Research method

The evaluation of the effects in HEARING pupils is based on the **experimental** method where the hearing first graders combined with the integrated hearing-impaired pupils represent the experimental group and the other two classes function as the control group.

In order to insure **internal validity** of project evaluation (the possibility of attributing the discovered differences between the compared groups in the final stage, i.e. after the first year of integration testing, to this particular project, and not to already existing differences between the groups in the initial stage), we studied the effects of some relevant factors of the initial state like:

- pupils' perceptive, motor and cognitive competence,
- pupils' verbal competence.
- initial command of linguistic skills (Slovene language)
- initial command of mathematical skills.

We statistically researched the effects of perceptive, motor, cognitive and verbal skills by employing the covariance analysis method. The first two factors of the initial situation were controlled as **co-variables**; the initial command of linguistic and mathematical skills, on the other hand, was controlled qualitatively, since this knowledge was acquired during the first two months of teaching within the framework of the project (experimental) teaching of integrated hearing and hearing-impaired children in the same first class as an experimental group and on the other side exclusively hearing children in the other class as a control group.

Since the internal validity of project evaluation also depends on the functioning of the **teacher** we decided to control this factor, too. Both teachers, the one teaching the

experimental group and the other teaching the control group, participate in this project on the basis of their own initiative and have many years of teaching practice (experimental group teacher up to 15 years, control group teacher over 30 years).They both teach according to the current curriculum, classical model of one year learning to read and write and numerical grading.

The evaluation of the effects in HEARING-IMPAIRED pupils is based on the **descriptive** method.

Sample

The third phase of the project started in the school year **1997/98** at the **Primary school Bojan Ilich in Maribor in the first grade.** Within the framework of statistical testing of the given hypotheses connected with the hearing pupils we defined the pupils in the first grade combined with integrated hearing-impaired pupils as the **experimental group** (n = 17) and the classes with no integrated pupils as the **control group** (n = 17). The compared groups represent a **simple random sample from a hypothetical population.**

The two boys are severely hearing-impaired (71-90dB), the girl is deaf or profoundly hearing-impaired (loss of hearing above 90dB). All three children suffer from hearing-impairment from before they were born (prenatal period). During the pre-school period (around the age of three) all pupils participated in an early hearing-speech therapy at *The Centre for Hearing and Speech in*

Maribor, they were included in a special group in the kindergarten, and immediately before entering school they were integrated in a regular preschool group. Chronological age of the children at the time of entering the first class of the primary school was 7.5 years for one boy and the girl and 7.8 years for the other boy.

Measuring instruments

For the collection of data we used the instruments with already tested measurement characteristics as well as some instruments that we devised ourselves to suit the needs of the project evaluation and we determined their measuring characteristics.

ACADIA

The data about the pupils perception, motor and cognitive abilities (as variables in the AKU procedure) were acquired by four modified ACADIA sub-tests:

- the test for measuring visual-motor co-ordination,
- visual discrimination,
- sequencing (progression), ciphering and
- conceptualisation

Since we used a modified form of an otherwise standardised test (Fakultet za defektologiju Sveucilista u Zagrebu, 1981), its **reliability** was additionally tested by Cronbach coefficient alpha. The coefficient α =0.833 confirms that the test is reliable enough even in this shortened form.

Pupil's verbal competences

We collected the data about the initial command of the pupils' linguistic skills, which in the process of analysis of covariance function as covariables. The test consists of three parts:

- sentence repetition (four sentences)
- story summarisation (nine sentences)
- picture description tasks (four pictures)

Measurement characteristics of the test are:

a) **Validity**

The test was first probed and the obtained results were taken into consideration when we created its final form. The rational validation was performed by the consultants (the advisors from the Centre in Maribor) who are competent to determine the validity of its content and form.

b) **Reliability**

The test was checked for reliability by the Cronbach coefficient alpha. As the coefficient α=0.817 we can define the language skills test as reliable.

c) **Objectivity**

The objectivity of the test administration is based on unambiguous detailed instructions for the test administrators or testers (for the use of aids, individual test administration, without additional help). The objectivity of the evaluation is based on the system of dichotomous marking of the answers where the assessment of correctness (attribution of points) does not depend on the subjective judgement of the tester.

Academic achievement tests

We used the following tests to check the initial command of linguistic skills in the Slovene language and mathematical skills:

1) The test of initial command of the Slovene language
   The test consists of 5 utterances equipped with pictures that the pupils have to copy in small letters.
2) The test of initial command of mathematical skills
   The test consists of 18 examples of equations of addition (in the form of a+x=c, x+b=c) with numbers up to 10. The pupils express the solutions in numbers and graphically.
3) Final dictation
   The dictation consists of 5 utterances. Its aim is to test the final command of spelling or orthography rules like the use of capital letters, words with sound shifts, consonant clusters, double consonants, diphthongs, palatalised –nj, -lj.

4) Final reading comprehension test
   This test has a form of an interpretation task. It consists of an introductory text of 178 words, followed by 4 questions with multiple choice answers among which the pupils have to choose and circle the correct one.
5) Final command of mathematical skills
   The test includes 4 examples of numerical expressions of addition and subtraction, 8 examples of equations ($a \pm x=c$, $x \pm b=c$) and 4 textual tasks of addition and subtraction up to 20.

Measurement characteristics of the academic achievement tests are:

a) **Validity**

All the tests were rationally validated. The appropriateness of the contents and form was tested by the teachers who have many years of experience in this line of work. We took their comments and suggestions into consideration when we created the final version of the tests.

b) **Reliability**

Cronbach co-efficient alpha (α) was used to determine the reliability of the tests.

The co-efficients of all tests rank between 0.80 and 0.85, which indicates that the tests are reliable enough. On the average the final tests are more reliable than the initial ones, which is mainly attributed to their length. At the end of the year we prolonged the written academic achievement tests since this was more in agreement with a larger extent of knowledge and a greater readiness or willingness of the pupils for the written testing.

We did not determine the reliability of dictation according to this method as we evaluated the correctness of the written text as a whole (sum total of correctly and incorrectly written words). We therefore applied the method of repetition (a three day interval). The calculated correlation co-efficient between the first and the second testing $r= 0.920$ tells us that this test is also reliable.

c) **Objectivity**

We ensured an objective administration of the academic achievement tests by providing detailed instructions for the testers (for the use of permissible aids, introductory instructions, and working without additional help, encouragement or reprimand). The objectivity of the evaluation of the solutions is based on a close type of tasks like gap fill, short answers, substitution tasks, alternative and multiple choice tasks with only one correct answer. The only exception in form is the dictation, but it was also possible to determine the correctness or accuracy of orthography in an entirely objective way.

Table 1. *Reliability of the academic achievement tests*

Academic achievement tests	α
The test of initial command of the Slovene language	0.811
The test of initial command of mathematical skills	0.850
Final reading comprehension test	0.850
Final command of mathematical skills	0.854

The protocol of recording the pupils' well-being feelings

We systematically recorded pupils' global well-being or feelings every month in five consecutive days as they expressed it on a three-stage scale. Numerical values were adapted to the evaluation degrees (maximum 3, medium 2, minimum 1), and this way the individual result on the scale of well-being for each pupil was obtained.

Measurement characteristics are:

a) **Validity**

We used a simple and in practice well established approach to measuring pupils' global physical well-being or feelings by choosing three different graphic symbols: ☺ - well, 😐 - partly well, ☹ badly

b) **Reliability**

We recorded pupils' well-being several times throughout the school year (once a month for five consecutive days); we, therefore, collected an adequate amount of pupils' responses to ensure the required reliability for the measurement of the pupils' well-being or feelings in the class.

c) **Objectivity**

The objectivity of the execution of recording or measuring the pupils' well-being is based on the instructions for the testers (simultaneous recording of the stages of the pupils' well-being). A three-stage assessment scale enables us to record the answers unambiguously and interpret them without judging them subjectively.

Sociometric test:

To determine the social status of the integrated hearing-impaired pupils and the social structure of the class in the initial and final phase of the project evaluation we used a traditional **sociometric test** (c.f. Moreno,1962) of positive and negative choices according to three criteria:

- Whom would you like to sit with in class?
- Whom would you go on a trip with?
- Whom would you like to play with in class?

This particular selection of criteria sheds light on the interactions among the pupils in the class in different various (not only learning or efficiency) situations.

Methods of data analysis

The data were analysed at the descriptive and inference level by using uni- and multivariate methods, presented in table 2.

Table 2. *Analyses and methods*

Analyses	**Methods**
• Effects in hearing pupils analysis	- t- test (independent samples test) - F- test (covariance analysis) - F- test of homogeneity of (Levene test)
• Effects in hearing-impaired pupils analysis	- success index (graphic presentation - pupil pattern and applied attempts of measuring effects) - rang list of learners according to the mean $\bar{x}$ average state of well-being / feeling
• reliability of instruments analysis	- Cronbach coefficient alpha - Pearson correlation coefficient

Results and interpretation

The effects of the project of integrating deaf and hearing impaired children into the regular primary school were compared in hearing and hearing-impaired children.

Project evaluation in hearing pupils

In agreement with the methodological requirements of the applied evaluation model (**single-factorial experiment** with classes as groups for comparison (comparative groups) and **covariance analysis** with two variables) we analysed:

- the initial situation (in the function of assuring the required internal validity of the project evaluation) from the point of view of the initial stage factors (perceptive, motor and cognitive abilities, verbal competence, command of the Slovene language and mathematical skills) and
- the final situation (in the function of investigating/examining the effects of the integration project) from the aspect of factors in the final stage (Slovene language and mathematics).

Initial situation analysis

At the beginning of the school year we controlled the following categories as variables:

- pupils' perceptive, motor and cognitive abilities
- pupils' verbal competencies
- the command of Slovene language skills
- the command of mathematic skills

The pupils' perceptive, motor and cognitive abilities and verbal competencies were controlled as co-variants within the framework of the final stage analysis.

The hypothesis about the **homogeneity of population variances** is justified in the verbal competencies test (P = 0.515) and in the command of Slovene test (P= 0.976) but not in the ACADIA (P = 0.045) and the mathematic skills test (P= 0.007)

In agreement with these results of F- homogeneity of variances test we used in the cases for testing the statistic significance of the difference between means a single variance estimate in forming the t – ratio and in the second two cases the calculation of t- test according to the formula which is an approximation of t-test (c.f. Ferguson, Takane 1989, p. 192).

Table 3. *The results of the analysis of the perceptive, motor and cognitive abilities (ACADIA), verbal competencies of the pupils, command of Slovene language skills and mathematic skills of the pupils in the experimental group (EG) and control group (CG)*

Variable	Group	Mean	Standard deviation	Homogeneity of variances test		Test of differences between two means	
		$\bar{x}$	s	F	P	t	P
ACADIA	EG	30.35	5.67	4.352	0.045	0.286	0.777
	CG	29.65	8.44				
verbal competence	EG	12.53	2.70	0.433	0.515	0.979	0.335
	CG	13.59	3.55				
Command of Slovene language skills	EG	5.12	1.17	0.001	0.976	0.632	0.532
	CG	5.35	0.99				
Command of mathemat. Skills	EG	25.94	6.63	8.295	0.007	01.411	0.171
	CG	28.53	3.64				

The figures of both t-tests show that there are **no statistically significant differences** in the results of the initial measuring of the pupils' perception, motor and cognitive abilities (P= 0.777) and verbal competencies (P = 0.335).

Final situation analysis

Our research includes the knowledge achieved at the end of the school year in the areas of:

- linguistic skills
- mathematic skills

Command of the Slovene language skills

We analysed:

- overall results from the test in Slovene language skills
- reading comprehension test results
- dictation results

The hypothesis of the homogeneity of variances is justified for all three criteria (P > 0.20).

The results of the general F-test of the integration model efficiency show that there are no significant differences between the compared groups in modified median values of the results of all three tests of the final knowledge of the Slovene language. In the case of overall result analysis there is, on the other hand, a tendency towards a difference (P< 0.08); the pupils in the experimental group (class 1a) with integrated hearing-impaired pupils obtained on the average better results than the pupils from the control group but this is not statistically significant. Their advantage was more due to their success in dictation than reading comprehension (P = 0.102).

Our research hypotheses about comparable successfulness of the pupils in both experimental and control group from the aspect of the knowledge of mother tongue (H1, H1.1, H1.2) were hereby confirmed. The pupils of the experimental group therefore do not lag behind in the process of learning how to read and write because of the presence of three hearing-impaired pupils in their class. There is even a slight tendency of gaining the advantage over non-integrated pupils in this area, although it is statistically non significant.

These results also require that we mention the presence of a special teacher-teacher of the deaf besides the regular class teacher in the experimental group, who does not only function to meet the needs of the integrated hearing-impaired pupils but, as our evaluation results prove, also has a positive effect on the others, i.e. the hearing pupils in class 1a.

Table 4. *The review of the results of the analysis of the Slovene language test, Reading comprehension test and Dictation of the pupils in experimental group (EG) and control group (CG)*

Criteria variables	Group	Mean value	Standard deviation	Homogeneity of variances test		Test of differences between means	
		$\bar{x}$	s	F	P	F	P
Slovene language	EG	37.94	2.54	1.157	0.290	3.412	0.075
	CG	36.08	6.24				
Reading	EG	6.23	0.83	1.478	0.233	0.907	0.348
	CG	6.00	1.32				
Dictation	EG	31.71	2.37	0.415	0.524	2.851	0.102
	CG	30.00	3.57				

Table 5 The result of the analysis of the mathematical test of the pupils in the experimental group (EG) and control group (CG)

Criteria variable	Group	Mean $\bar{x}$	Standard deviation s	Test of homogeneity of variances F	P	Test of differences between means F	P
Mathematics	EG	18.29	0.92	2.643	0.114	6.498	0.016
	CG	17.00	2.32				

Command of the mathematic skills

We analysed:

- the result of the mathematical test

The **homogeneity of population variances** test shows that our hypothesis was again confirmed and justified. (P=0,114).

The difference between the experimental and control group in modified average achievement at the mathematical test is, as Table 4 shows, **statistically significant.** The pupils in the experimental group were **more successful** than the pupils in the control group.

Our research hypothesis (H2) about the absence of markers of lagging behind of the pupils in the experimental group compared to those in the control group in the knowledge of mathematics after the first year of the project is justified. Even more important – like in the Slovene language skills analysis, there is not only the absence of deficits but also an important advantage for the pupils in the first grade with three integrated hearing-impaired children who did not have any advantages at the initial stage (c.f. table 2) over those with no integrated pupils. The achieved average is even lower, although statistically non-significant, from the average of the group of pupils without any hearing-impaired children.

On the basis of the results of testing mathematic skills at the end of the first year, too it can be deduced that there are favourable effects of the specific didactic approach, connected with the chosen model of integration, on the hearing pupils in the experimental group.

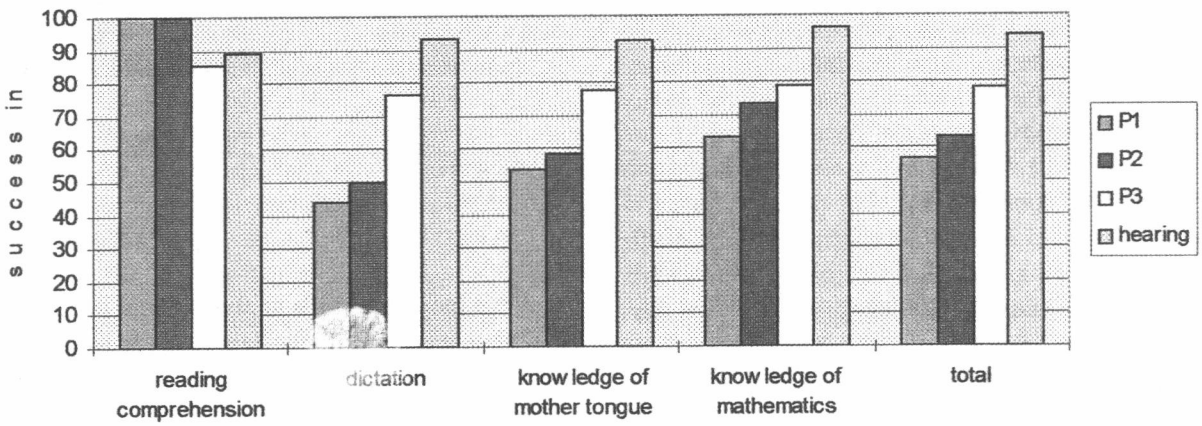
Summary: *The analysis of the effects of the integration project on the HEARING pupils shows that there are* ***no negative effects*** *on the pupils in the area of academic achievement. On the contrary, their achievements at the final stage are even* ***higher*** *(better) than those of the pupils in the control group, which is statistically significant in the mathematic skills but not in the Slovene language skills.*

Project evaluation analysis in hearing-impaired pupils

To investigate integration effects in hearing-impaired pupils in a broader sense, i.e. the achieved level of their academic achievement, emotional and social integration, we included the following criteria into the analysis:

- command of Slovene language skills and mathematic skills at the end of the school year
- well-being of the pupils in the class
- social status of the pupils in the class at the end of the school year

Graph 1. *Effectiveness of the integrated hearing-impaired pupils as individuals and the hearing first graders as a group in the tests of linguistic and mathematic skills at the end of the school year*



Command of Slovene language skills and mathematic skills

We analysed:

- results after the dictation
- results of the reading comprehension test
- overall results of the Slovene language test
- results of the mathematical test
- collective results of the mother tongue and mathematic skills test

We calculated success indexes on the basis of the points scored on individual tests of knowledge. Relative success is expressed in percentages (%).

Individual success indexes of three integrated hearing-impaired pupils and the group success index of the hearing first graders can be seen in the following graphic representation:

All integrated pupils achieved relatively highest results at the reading comprehension test (P1 and P2 100%, P3 85.7%) and all together the average of 93.3%, which is better than the average of the hearing pupils – 89.1%. This is attributed to a supposed higher degree of motivation, continuous hearing-speech therapies and permanent daily help.

In dictation P3 was the most successful among the integrated pupils (76.5 %), P1 was the least successful (44.1%9) and their average 56.9 % does not come close to the average of the hearing pupils (93.3%), which is perfectly understandable since this test is based on aural perception, namely the area where the integrated pupils are handicapped.

The analysis of the overall results in the Slovene language skills test shows that P3 was the most successful (78%), followed by P2 (58.5%) and P1 (53.7%); their common average success index (63.4%) is therefore lower than the index of the hearing pupils.

P3 was again the best at the test in mathematic skills (78.9%), P1 was the least successful with 63.2%, all together with the average 71.9% in the knowledge of mathematics they do not win over the hearing pupils (96.3%).

As it can be seen from the last set of data on the graph in Picture 1, P3 achieved the highest score among the integrated hearing-impaired pupils in Slovene language skills and mathematic skills with 78.3%, followed by P2 (63.3%) and P1 (56.7%); all together 66.1%, which is lower than the average of their hearing peers in the first grade (93.7%).

On the basis of the results obtained from the tests in Slovene language skills and mathematic skills at the end of the school year, i.e. after the first year of the project work with hearing-impaired pupils in the primary school, we assess

the **efficiency** of educational **integration** of all three pupils as **successful**. The results of the efficiency integration in linguistic skills and academic achievement vary quite a lot with integrated pupils. This integration is most successful with P3. We hypothetically attribute this result to very well developed socio-emotional skills, the abilities to conform and to a very high intellectual potential.

Well-being of the pupils in the class

On the basis of collected data on the level of pupils' well-being in the class (c.f.4.3.4.) the average individual well-being was calculated and further used as the value for placing integrated hearing-impaired pupils as individuals and the hearing first graders as a group onto the rang list.

Table 6. *Hearing-impaired and hearing pupils according to their well-being in the class in the direction towards more pleasant well-being*

Rang	Pupils
1	P3
2	P1
3	Hearing
4	P2

The highest level of well-being in the class among the integrated pupils is evident with P3 ($\bar{x}$ = 2.9), followed by P1 ($\bar{x}$ = 2.8), and P2 on the last place ($\bar{x}$ =2.2); their common average ($\bar{x}$ = 2.6) is close to the average of the hearing first graders ($\bar{x}$ =2.5)

The results of the well-being in the class analysis show that the integrated pupils as a group feel at least as good as all other pupils in the class; therefore, it is generally assessed that the **process of emotional integration** is **successful** although it is more so for both of the **boys** than for the girl.

Social status of the pupils in the class

To investigate the social status of the first graders at the end of the school year we carried out a socio-metric test of positive and negative choices according to three criteria in January 1998 and in June 1998. We requested answers to three questions:

- Whom would you /not/ like to sit with in class?
- Whom would you /not/ like to go on a trip with?
- Whom would you /not/ like to play with in class?

The basic findings of the analysis of the socio-metric data are:

- among the hearing pupils there is **no** positive **mutual** nor **unilateral** selection according to any criteria which would be present during the first measurement;
- among the hearing pupils one of them chose positively according to all three criteria an integrated hearing-impaired boy P3 and the same P3 also chose him, so a **pair of hearing and hearing-impaired** pupils appeared which was previously not the case (during the first measurement).
- two integrated pupils – P2 and P1 are **isolated,** as none of the hearing pupils in the class decided to choose them according to any of the criteria in the positive sense.
- There also occurred a **negative selection** of integrated pupils, not yet present in the first half of the school year, in the case of three hearing girls who according to all three criteria decline the hearing-impaired girl P2.

The analysis of the socio-metric data of the second testing shows that the most favourable socio-metric position among the integrated hearing-impaired pupils is held by P3, i.e. the boy with the highest level of acquired knowledge in mother tongue, mathematics and also well-being in the class, whereas P1and P2 were isolated at

the end of the school year - the latter was even rejected by the hearing pupils. On the basis of these findings we conclude that the process of social integration is successful for P3 and less successful for P1 and P2.

Summary: *The analysis of the effects of the integration project in HEARING-IMPAIRED pupils reveals that pupil* ***P3*** *reaches the highest level of linguistic and academic achievement, emotional and social integration;* ***P1*** *achieves besides satisfactory efficiency also a successful emotional integration but faces an unsatisfactory process of social integration; pupil* ***P2*** *experiences most favourably the efficiency integration, less favourably the emotional and even less the social integration with the hearing peers.*

Conclusion

Evaluation of the integration project of deaf and hearing-impaired children into a regular primary school carried out after the first year of testing in our teaching practice includes the observation of its effects on **hearing** and **hearing-impaired** pupils. The testing of effects on hearing pupils was **experimental**, accompanied by statistic control of the initial differences between the compared groups of pupils; in hearing-impaired pupils the testing was **non-experimental**, on the level of descriptive statistic analyses.

The criteria of the effectiveness of the chosen integration model are related to the acquired knowledge in case of hearing pupils and to the achieved level of **efficiency, emotional and social** integration at the end of the first grade in case of hearing-impaired pupils.

Our basic **evaluation findings** are the following:

1) After the initial year the project of integration of deaf and hearing-impaired pupils did not result in any negative effects on the hearing first graders who attended classes together with hearing-impaired integrated children; their level of knowledge was comparable to the level of knowledge in the group of first graders without integrated pupils.
2) Among the hearing-impaired pupils the differences were observed in the achieved process levels of their efficiency, emotional and social integration. Pupil P3 reached the highest level in all three aspects, P1 and P2 the lowest level in social integration, whereby both pupils exhibited a satisfactory level (comparable with their hearing peers) of efficiency integration, but not of the social and, specifically for the girl, also not on the level of emotional integration.

The established differences between the three hearing-impaired children regarding the success of integration can be connected with the differences in their hearing status and communication skills. The girl is namely deaf, the boys severely hearing-impaired. There exist several other internal and external factors (e.g., intellectual and other abilities, specific personality and emotional characteristics, conditions in the family) which directly or indirectly as well as interactively influence the differences in the course of their efficiency, emotional and social integration.

On the basis of data collected in the first (summative) evaluation phase, we can assess that from the aspect of hearing pupils, the chosen model of integration of deaf and hearing impaired children into a regular schooling setting has proved **suitable,** while from the viewpoint of hearing-impaired children the success of the model depends on the work achieved within the framework of **individualised programmes** and **compensational therapeutic programmes** for integrated pupils as individuals.

The data favouring the experimental group **cannot be generalised**. We have to take into account all the **additional factors** acting on the group. These are:

- Greater motivation and awareness of all subjects in the experimental group due to the known placebo effects,

- Flexibility, ability of co-operative participation of primary teacher and special teacher in the class, clear definition of their roles in organising classes with the support of the school management.
- Daily treatment of children and monitoring of parents by the professional staff of the Centre for Hearing and Speech.

The professional starting points for work in an integrated school setting in the coming school year should include careful planning for furthering emotional and social integration. To this end close contacts and interactions between hearing pupils and their hearing-impaired counterparts during lessons should be encouraged through various flexible work methods (co-operative learning group, pair work, small temporary groups). With systematic implementation of the social inclusion programme (which could be partly carried out at the Centre) all the children would have the opportunity to gain new social experiences and a greater awareness of the hearing difficulties of their peers. In this way the impatience towards otherness would be lessened. The attention should be directed also towards integration in the family and in society (exterior integration), which is for the children with a hearing impairment of equal importance as integration in school.

To better prepare the ground for integration and to ensure the continuity of schoolwork, the already functioning structure of the enlarged team (special teacher, primary teacher, individual therapists, pedagogue, psychologist, management staff should also include a teacher who would take responsibility for the integrated group in the future. Organising visits to integrated classes for the school staff, introducing the experiences and presenting the work strategies used with hearing-impaired children at professional meetings can certainly contribute to a better understanding and better planning of integration in the future.

The implementation of the full integration model will continue in the future and along with it the necessary evaluation and monitoring.

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