Abstract

The aim of the article is to find out theoretical and practical aspects related to the socio-cultural impact on the acquisition of basic skills of the sign language and spoken/written language for hearing-impaired children having severe disorders at a pre-school educational establishment; to explore the theoretical aspects.

The article is based on the research of C. Backer’s scientific literature about basic language skills. The paper deals with the dual coding model of A. Paivio and A. Desrochers, its impact on the reading skills and writing skills of children with severe hearing impairments basing on the basic language skills, theoretical analysis methods about language acquisition skills and special practical approaches letting research reading skills and writing skills among hearing-impaired children.

They indicate the relation between the dynamics of the acquisition of the sign language and the spoken/written language for children with severe language impairments depending on the socio-cultural impact creating priorities for children in the choice of the sign and spoken/written language acquisition. The results obtained during the research indicate the link between the sign and
spoken/written language acquisition skills in the learning process for hearing-impaired children at pre-school educational establishments.

The impact of socio-cultural environment makes to choose pedagogical methods and techniques in the acquisition of the sign language and spoken/written language skills among children with severe hearing impairments. The overview and analysis of theoretical and practical material enable to consider the regularities of the acquisition of the sign language and spoken/written language which will help to improve the learning process for hearing-impaired children at pre-school educational establishments. If these techniques and methods are applied qualitatively, the learning process for children with severe hearing impairments is formed positively and dynamically.

Key words: bilingual method; education content; hearing-impaired children; sign language; spoken/written language.

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1. Introduction

In the world and Europe that are several studies on the bilingual method for the hearing-impaired children, but in Latvia the bilingual education has been studied only in relation to hearing children. At present this theme in Latvia is very topical, because parents choose for the hearing-impaired children the acquisition of educational programs envisaged for hearing children studying at comprehensive schools; this complicates the situation for the hearing-impaired child, the teacher and parents.

At the beginning of the article the author shall discuss the concepts of a word, an action and thinking by quoting D. Uznadze, A. A. Leontyev and L. Vygotsky, because these concepts are closely interrelated in connection to the bilingual education and dual coding or divergent thinking for the hearing-impaired children.

According to D. Uznadze, a word since its origins has been the means for communication and mutual understanding between an adult and a child; gradually it is attributed certain meaning and becomes the manifestation of a concept. Thus a child acquires the adults’ speech, instead of creating its own (Узнадзе Д. Н., 2001).

The most important for the above mentioned is a peculiar qualitative action; according to these qualities we can consider an action, playing and cognitive actions to be an independent type of an action. These are different forms of an action. The external and internal forms of an action are interrelated and transform from one into another within the interization and exterization processes (Леонтьев А. А., 2005).

A thought does not consist of separate words; according to L. Vygotsky, the function of thinking depends on the fact, how is the structure of thought formed out of which the thought consists and it depends also from the availability of the character of the respective intellectual thinking operations (Вygотский Л. С., 1960).

Bilingual education, within the process of which we use two languages for the teaching purposes, differs from the ordinary and traditional one by the fact that the language we use for teaching any particular action or school subject, is the process of studying and the aim of teaching (Алийев Р., Kaže N., 2001). The language is being acquired best within the important and significant context; thus the double task is set. In order to achieve the aims of the double task it is necessary to have balance between the particular languages that are focused on the content of an action or a school subject, the specificity of an action, the fulfilment of linguistics according to the child’s needs and developmental level.

The aim of the article is a brief insight into the peculiarities of bilingual theory and dual coding or divergent thinking, as well as the summary of the results of establishing research on the hearing-impaired children at pre-school educational establishments in Latvia.

2. Method

- Theoretical insight into the bilingual education (Алийев Р., Kaže N.; Baker C.; Cummins J.; Fishman J. A.; Paivio A. and Desrochers A.).
- Establishing research at a specialized pre-school educational establishment.
- Processing of obtained data by means of SPSS:17, their analysis.

Brief insight into the theory of bilingual education that is based on the basic principles of bilingual education according to Aliyev, Kaze, Baker:

1. simultaneous – if the child acquires two languages simultaneously. Such a situation takes place, if each parent communicates to the child in his/her own language.
2. consecutive – if the child acquires one language first and then — the other, is related to the acquisition of the second language. Usually, according to this basic principle, spoken/written language is being acquired by hearing-impaired children, because, according to the medical and psychological view, consecutive bilingualism is related to the acquisition of the second language, i.e., to the acquisition of one the languages: the sign language or the spoken/written language.

Researchers R. Aliyev, N. Kaze, C. Baker theoretically, according to the psychologically pedagogical point of view, group the bilingual education into two types – the content-oriented and subject-oriented:

1. Content-oriented bilingual education offers the educational content equally in two languages with the aim of developing a bilingual and bicultural personality. This method is used in the society, where there is a polyethnic structure of population, i.e., children of national or language minority are ensured an opportunity to acquire one and
the same school subjects simultaneously in two languages – in their native language and in the prestigious one; this approach could be acceptable in separate cases, since, on the one hand it facilitates the integration of population into the society to which they have emigrated, but, on the other hand, it enables to preserve the national identity.

2. Subject-oriented bilingual education offers several school subjects in one language, namely — in the first one, but the rest of the subjects are offered in the second language, i.e., in the foreign language. According to the point of view of independent experts, this method cannot develop a bilingual personality. If a part of a cultural value is perceived in the first language, but the others — in the second language, i.e., it is not possible to ensure the bilingual personality of a full value, because in this case does not develop either mental thinking or creative thinking of language (Alijevs R., Kaže N., 2001). Researchers R. Aliyev and N. Kaze point out that these two psychologically pedagogical types of bilingual education differ on principle, because they have different sub-aims.

The author of the article wanted to perceive both psychologically pedagogical types in relation to the bilingual method for the hearing-impaired child. In the study process of bilingual education, the psychologically pedagogical processes for the hearing-impaired child take place differently from those of a hearing child, because there should be taken into account the individual psychological peculiarities of the child’s perception. In the subject-oriented bilingual education the hearing-impaired children would be in a more favourable situation, if a school subject would be taught in one or another language, i.e., in the sign language or in the spoken/written language. But, according to R. Aliyev, N. Kaze, C. Baker, the researchers of the theory of bilingual education: “because in this case does not develop either mental thinking or creative thinking of language”.

Balanced bilingualism, according to J. Fishman, is a situation, when people can use two languages at an equally good level. If, irrespective of the context, a person can communicate in two languages, it is possible to speak of the balanced or harmonious bilingualism. It is the research and analysis of balanced bilingual children that proves the positive cognitive effect of bilingualism (Fishman J., 1980). According to F. Grosjean, there should be taken into account one problem. It is possible that two languages have been acquired at the same level, but this level may be low (Grosjean F., 1985). Usually the researchers focus on the persons with relatively good skills of both languages. An example of balanced bilingualism is a child, who at a school can acquire school subjects in any of the two languages. The concept of balanced bilingualism is a bit idealized, as pointed out by J. Fishman, only some people use both languages equally well in any situation. Usually languages are used in the different functions of situations: one language for the employment relationships, but the other — in the family or everyday life (Fishman J.A., 1980).

Thus the term balanced bilingualism shall be used, while taking into account the following aspects:

a) the monolinguis’t’s language skills must not be considered as the frame of reference;

b) how to consider the levels of language skills (Baker C., 2001).

The author of the article paid attention to this principle, because she finds that it is necessary to introduce balanced bilingualism for the hearing-impaired children — it would facilitate the development and improvement of these children’s cognitive effect. In its turn, when focusing on F. Grosjean’s argument, we can find that it corresponds to the particular situation, because hearing-impaired children are better at using the sign language than the spoken/written one.

From the psychological and pedagogical aspect, instead of focusing attention within the study process on the children’s abilities and skills that have not been developed or improved at a specialized pre-school educational establishment, it shall be focused on the fact, what skills have been developed and how to apply them more successfully for the achievement of the aim. The hearing-impaired people have a natural, fully functioning visual communication type. Its use is more perspective and efficient that the artificially maintained language communication, because there is a risk to obtain partially developed language that influences skills.

Studies of bilingualism and divergent thinking make to think that the bilingual children are preeminent than the monolingual children, perhaps, the skills of two languages enable to relate language to thinking better. Most of the bilingual children possess a wider total vocabulary than the monolingual children. It refers to children without hearing impairments. And what is the situation in relation to hearing-impaired children?

The balanced bilingual children possess metalinguistic abilities of higher level; it refers to both the ability to analyze one’s knowledge of language and the ability to control the inner processing of language (Bialystok E., 1992). Thus it facilitates earlier development of reading skills that ensures better level of progress. Therefore, according to J. Cummins’ theory, there should be achieved certain level of the skills of both languages in order bilingualism shall start positively influence the development of metalinguistic abilities. This may be referred to the hearing-impaired children; the sooner the hearing-impaired child is provided the insight into, and abilities and skills
of both languages, i.e., the sign language and the spoken/written language, the better the hearing-impaired child shall socialize.

The conclusions drawn by the experienced USA and Western European educators on “living and learning in two languages”:

a) language acquisition is an active process that is the most successful in the natural communicative situations;

b) all languages are of equal value, they possess particular integrity and they shall be treated with respect;

c) languages “build bridges” — between the educational establishment and home, between the school and the community, and, finally, between cultures;

d) language is thinking; when acquiring language, bilingualism helps to think before expressing one’s thoughts;

e) the language shall be maintained, and it needs the development;

f) a true educator cannot implement the initial stage of teaching the second language without the use of the first language as the support language.

Knowledge of language that differs depending on the children’s cognitive development functions as a variable that determines the influence of bilingual experience on the further cognitive development. In Figure 1 you can see the characterization of the model of bilingual dual coding system designed according to the bilingual experience of cognitive development described by A. Paivio and A. Desrochers; it includes: two separate systems of spoken/written language, one for each language. The author of the article draws a conclusion that this model of dual coding or divergent thinking is related also to the hearing-impaired children, because the child speaks in a sign language, but reads and writes in a spoken/written language. The child in a real situation, already since the first days at the specialized pre-school educational establishment, by the assistance of an educator starts to develop one’s individual divergent thinking (See Figure 1).

Thus, if we connect linguistic functions with the general cognitive processes, the following is formed:

- the system of separate non-verbal associations, functioning independently from the verbal systems of both languages;
- the functioning of non-verbal system in a way of the common conceptual system of both languages;
- stable, closely interrelated channels, connecting these three autonomous systems;
- interrelation between both languages, comprising the systems of associations and interpretation.

Referring to Figure 1 it is possible to speak about the model of common basic skills; the following features are characteristic to the model:

1. Irrespective of the fact, which language at a particular moment is used by the person, the process of thinking is ensured by the same driving force. If a person knows two or even more languages, the source of thinking is the same.
2. Bilingualism is possible, because a human being possesses ability to accumulate the facts of two or more languages and to apply them.
3. The accumulation and application of information, thinking and knowledge may take place both in one language and in several languages. Both channels are connected to one and the same system of information processing.
4. The child must know the language used within the study process in order he/she could acquire new knowledge in this language.
5. Speaking, listening, reading and writing in the first or the second language facilitate the development of the whole cognitive system. If a child must acquire the new knowledge in a language he/she does not know sufficiently, the cognitive system will not function to the utmost efficiently (Skutnabb-Kangas T., Cummins J., 1988).
If one or both languages do not function at their full value, it may negatively influence both cognitive function and progress within the study process.

The knowledge of sign language and spoken/written language in the deaf community:
1. To communicate as much as possible in order to perfect the sign language.
2. In the deaf community the speech differs from the hearing-impaired educator’s sign language.
3. Emotional openness, expression of one’s emotions.
4. The hearing and the hearing-impaired educators work in a team, smooth out the differences between both worlds. Thus the hearing-impaired educator understands that the sign language was not grammatically correctly used; it creates pressure on the hearing-impaired educator and thus also the alterations in the study process of sign language.

The responsibility of the system is as follows — it is necessary to make sure, how the teacher understands the theoretical basics of changes. It requires a very large educational program. As well as it is necessary to educate teachers, researchers, observers on the use of video, on the fact, how delicate we should be towards a hearing-impaired child and his/her needs.

It is necessary to ensure the developmental link at the specialized pre-school educational establishment between:

- cognitive development;
- development of skills and abilities;
- linguistic development.
It is necessary to facilitate the hearing-impaired child’s general development in all these directions; these social and cultural aspects are interrelated, because at the pre-school educational establishment the hearing-impaired child acquires both languages at the respective socio-cultural moments:

a) atmosphere – if it is open, natural, oriented towards social interaction, enables each child to introduce his/her culture, the introduced aspects will positively influence other spheres.

b) acquisition of language at the pre-school educational establishment.

The author of the article has defined the principles of “social strategy” or methodological guidelines for educators for the commencing of bilingual classes for hearing-impaired children at the pre-school preparatory stage:

1. find some most cooperative and friendly children, who would be an educator’s assistants during the common games and classes;
2. ask them to sit next to the less active and timid children and form small groups or pairs for cooperation, i.e., apply the cooperative teaching method;
3. use the common board games, the self-made and the bought ones, including also lotto, as much as possible in order to facilitate the acquisition of both languages by hearing-impaired children.
4. cooperation in groups or pair work shall be carried out at the classes through shaping and drawing;
5. if it is possible, use the common games in the sandboxes or on the recreation grounds, where both educators would be involved, i.e., hearing educator and hearing-impaired educator;
6. generalize and classify, analyze objects and pictures in both languages;
7. use the plot-role games in both languages;
8. use the pantomime and guessing tasks;
9. use the finger games, thus developing the child’s sight perception, attention, thinking;
10. develop sentences according to the pictures in both languages, i.e., the sign and the spoken/written language;
11. use the crosswords in both languages.

While using these different techniques of activities, an educator, when planning and carrying out the activity, shall have to (See Table 1):

Table 1

<table>
<thead>
<tr>
<th>Planning of activities</th>
<th>Carrying out activities</th>
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<tbody>
<tr>
<td>When defining the specific aspects of language to be taught to children, make sure, whether they are in conformity with the study programs of other subjects.</td>
<td>Make sure that in all activities there has been used the spoken/written language.</td>
</tr>
<tr>
<td>Choose the appropriate activities that develop the respective aspects.</td>
<td>Acquaint the children with the new words; when explaining, the non-verbal language (gestures and movements), if it is possible.</td>
</tr>
<tr>
<td>Develop the list of the words the activities shall focus on.</td>
<td>Encourage the children to use the new words for the purposes of the particular activity.</td>
</tr>
<tr>
<td>Write the informal dialogues that could develop due to the chosen activities.</td>
<td>Create an informal situation for the children to practice the dialogues during the activities.</td>
</tr>
<tr>
<td>Prepare “the language samples” that could be used.</td>
<td>Develop the children’s sign and spoken/written language.</td>
</tr>
<tr>
<td>Develop the informal educator’s conversation that would accompany the chosen activity.</td>
<td>Draw spoken/written conclusions on the progress of children’s activities and the particular stage.</td>
</tr>
<tr>
<td>Consider the variants of activities according to the children’s language level.</td>
<td>Pay attention to a particular language aspect at the certain moment of situation and use it as a short non-planned grammar class.</td>
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</table>

Using and knowledge of the structure of both languages – the sign language and the spoken/written language – is one of the most important parts of language study process:

1. the grammar of sign language is important for the hearing educator within the study process;
2. The grammar of spoken/written language is important for the hearing-impaired educator within the study process.

The author of the article emphasizes that as a result of the above mentioned there is defined the principle for the development of the bilingual teaching method concerning sign language and spoken/written language at a pre-school educational establishment (See author’s design in Figure 2).

![Fig. 2. The Development of the Bilingual Method of Sign Language and Spoken/Written at a Specialized Pre-School Educational Establishment. (Author’s design).](image)

This bilingual method requires not only profound knowledge, but also the “home language” knowledge of spoken/written language. While teaching, the hearing-impaired educator shall be ready to explain the differences concerning grammar that the hearing-impaired educator does not notice at all and perceives them as obvious.

A program, where one aspect has been emphasized, may be ignored, because an individual will not have the development of full value, but the individual shall develop fully in all three directions.

In the establishing research there were 14 hearing-impaired children involved; 7 of them are from the hearing families, but 7 — from the deaf families. The children were at the age from 4 to 6. The research was performed within the period of time of the year 2009. In the research there was the writing aspect included in relation to the sign language and spoken/written language. The results of research were processed by means of SPSS:17.

Each totality of subtest is divided into three levels, but the self-test totality is performed three times in one testing, but, in order to exclude contingency or coincidence, it is performed repeatedly in three approaches once a quarter (once in four months). There were developed the indicators for the sign language and the spoken/written language on the basis of writing and reading; according to F. Grosjean, we cannot use pronunciation as an indicator, because the pronunciation of a hearing-impaired child of this age has not developed and improved (See Table 2).

<table>
<thead>
<tr>
<th>Test Indicators</th>
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<tbody>
<tr>
<td>Indicators of sign language</td>
</tr>
<tr>
<td>1. The correspondence of sign language to the picture</td>
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</table>
2. The correspondence of sign language to the spoken printed/written word
   The perception of a word by means of finger spelling or a printed/written word
   Illustrating of a text
   The ability to read the writing – the finger spelling of a word according to the writing

3. Answers to the written questions
   Lip-reading of a word or a phrase
   Development of a printed text in simple sentences according to a corresponding consistency
   Identifying of a mistake in the early writing or in a printed word

The essence of performing the test assignments of a progressive matrix is that by repeating and explaining we obtain better and better results of the particular test assignment. The most effective is not the method envisaging only accurate use of linguistic forms, but the method enabling to achieve the understanding of meaning and its acquisition.

3. Results and Discussion

When summarizing the results of the acquisition of sign language and spoken/written language by the hearing-impaired children, there were developed the test indicators in the sign language and spoken/written language on the basis of language elements: writing, reading and its use (See Table 2.). When performing establishing experiment to find out the actual situation of hearing-impaired children in relation to the level of their skills of sign language and spoken/written language there were obtained the establishing starting data that were included into the table of initial data, identifying the research field and problem in order to establish the interrelations between the study process participants’ sign language and spoken/written language, to advance the hypothesis and to determine the criteria characterizing the study process of the bilingual methods of sign language and spoken/written language and the corresponding indicators. In order to verify the correspondence of data to the advanced issue, we have used SPSS:17 Kolmogorov-Smirnov (D) criterion with Lilliefors Significance Correction and Shapiro-Wilk criterion test. The data processing for the establishing empirical research shows that there is no normal distribution or non-parametrical tests. The parameters show the data asymmetry or SD – 2.646 up to 0.909 that indicates the own asymmetry SE, which is acceptable. Thus in the column diagrams the Gaussian curve will be deviated to the left away from y-axis, because there is no normal distribution between the groups, but it is a left-oriented asymmetric distribution.

Thus between N groups, for the children from hearing and hearing-impaired families there were significant differences established in the following variable indicators – “Sign language” with Asymp. Sig. (2-tailed) – 0.023 and Tables Asymp. Sig. (2-tailed) – 0.009 according to Mann-Whitney U-test and Wilcoxon W criterion test. The asymmetrical statistically significant indicates the reciprocal link that proves the relation between its government and the corresponding indicator, in this case — Tables. In these variable indicators the establishing meaning have “Sign language” and “Tables” that have been included into the SL indicators of reading; it is also indicating the compensating nature of hearing-impaired children in relation to the lack of spoken/written language in communication.

The Table of Ranks of Establishing Experiment

<table>
<thead>
<tr>
<th>Rank</th>
<th>Indicators</th>
<th>$M$ rank for HI</th>
<th>$M$ rank for H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tables</td>
<td>10.21</td>
<td>4.79</td>
</tr>
<tr>
<td>2</td>
<td>Sign language</td>
<td>9.79</td>
<td>5.21***</td>
</tr>
<tr>
<td>3</td>
<td>Finger spelling</td>
<td>9.29</td>
<td>5.71**</td>
</tr>
<tr>
<td>4</td>
<td>Writing</td>
<td>9.21</td>
<td>5.79*</td>
</tr>
</tbody>
</table>

$M$- arithmetical mean.

***-high

**-higher

*-the highest
In the variable “Finger spelling” and “Writing” there were no differences found. It means that this indicator is equally explicit between the children from the hearing and hearing-impaired families. The indicator “Tables”, the reciprocal asymmetry statistically significant of which is =0.009, indicates a very considerable significance that repeatedly proves the significance of “Reading” indicators.

In the establishing experiment it is important to determine, in which variables there are significant differences, and in which there are no significant differences. This means, which variables will be analysed according to the Rank method. In this case there was taken the table under the title “Test Statistics” and viewed the indicator “Asymp.Sig. (2-tailed)”.

The results of the indicators of “Test Statistics” are shown in Figures 3 and 4.

![Figure 3. The Scale of the Results of Establishing Experiment regarding the Sign Language.](image)

When referring to and analysing Figure 3, we can clearly see the significance of sign language in the study process, as well as finger spelling that indicates the necessity of children’s “early writing” in the study process at the specialized pre-school educational establishment, which is directly related to the uncoding of sign language.

But, when referring to Figure 4, and analysing it, we can establish that an important element of spoken/written language for the hearing-impaired children is finger spelling, because it has one of the highest results in relation to “the early writing”. Hearing-impaired children show the same results in finger spelling and reading of separate words or phrases, namely, in “Reading” or “Tables”. It could be explained by the fact that within the spoken/written communication process for the hearing-impaired children very important is “early writing” and “early reading”; thus the awareness and understanding of the word they have read.

The study of the differences by means of Mann-Whitney U-test (a non-parametric criterion) evaluating the indicators of the mean tendencies of groups.

There are differences regarding the indicators in the groups between the children from the hearing and hearing-impaired families. Thus there has been proved the issue concerning the influence of the environment of the social agents of sign language on a hearing-impaired child, but we cannot reject the issue concerning the differences in the indicators of the groups between the children from hearing and hearing-impaired families that indicates the necessity of spoken/written language in the study process. Thus the establishing experiment has identified the research field and problem for the further research activities, as well as defined the research criteria and indicators. These indicators and criteria have been systemized in “Bilingual Study Method of Sign Language and Spoken/Written Language for the Hearing-Impaired Children”.

After the analysis of theoretical literature and sources (studies of research context), there were criteria, indicators and the descriptions of competence levels, a part of which is shown in Table 2 of this article.

There is a discussion issue identified that could determine further development of articles.
In the balanced bilingualism there shall be necessary close cooperation among all educators and assisting staff, as well as the children’s parents. According to the author, in this bilingualism there shall be necessary more qualitative preparation of the respective educators, as well as a differentiated study program of specialized pre-school education, where there would be observed the succession and consistency in the educational system.

One of the discussion issues is, whether the balanced bilingualism will facilitate the development and perfection of hearing-impaired children’s spoken/written language, as it is in the case of sign.

4. Conclusion

In the data processing of the results of establishing research by means of SPSS:17 the indicator “Tables”, the reciprocal asymmetry statistically significant of which is =.009, indicates a very considerable significance that repeatedly proves the significance of “Reading” indicators. Within the research, the hearing-impaired children from the hearing families had better results in relation to “Reading” indicators that could prove the significance of spoken/written language for these children, as well as the compensating type of communication.

The research results show equal results for the hearing-impaired child concerning finger spelling and reading of separate words and phrases, namely concerning “Reading” or “Tables”. It could be explained by the fact that within the spoken/written communication process for the hearing-impaired children very important is “early writing” and “early reading” or global reading; thus the awareness and understanding of the word they have read.

Dealing with the ensuring of educational quality makes the specialized pre-school educational establishment to look for the solutions for “the hidden educational program or the consolidated program” in the aspects caused by the interaction between the educator and the child.

On the basis of J. A. Fishman’s views, in the balanced bilingualism there are both languages used equally, but the establishing research shows better results concerning the sign language, the sign language is used more often and, according to F. Grosjean’s point of view, there will be always a language that would be at a bit lower level of usage. The author of the article would like to emphasize that it is necessary to pay more attention to the balanced bilingualism, correcting the educational program.

As a result of establishing research, where there were 14 hearing-impaired children involved, a conclusion was drawn that, irrespective of the child’s hearing perception, the child is able to acquire the educational program depending on his/her intellectual potential. The establishing research also shows that dual coding or divergent thinking depend on the intellectual abilities to perceive the surrounding situation.
References: