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On some aspect of teaching hearing-handicapped students in standard courses

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Abstract

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1. Introduction

Standard university studies are prepared for students without any handicap, thus using all senses to ensure effectiveness of information transmission and gaining of skills. Nevertheless, if among other students there is a handicapped one, this effectiveness of teaching and learning process is corrupted in his case. The matter of their handicap is not their mind, but their motional or sense disabilities. We need additional methods to restore the effectiveness of teaching/learning process for handicapped student who participates to standard university courses. This is also the case of handicapped student with hearing impairment. The importance of the study of such method is enhanced by the fact if the handicapped student is trained to become teacher. The quality of education of this future teacher with handicap will have a great impact if he/she will educate handicapped children. We focus our study on some rules that must be fulfilled when teaching handicapped student with hearing impairment. This is important also in the case of mathematics and physics – it is not sufficient to write equations on the blackboard.

2. Center for handicapped students

There exist specialized centers for handicapped students at many universities. At Masaryk University (Brno, Czech Republic) Teiresias center try to help handicapped students with their specific needs and afford them a convenient environment. Teiresias center at Masaryk University has a rich experience with the learning of the handicapped students. Its task is to ensure that study subjects are as much as possible accessible to students with

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visual, hearing and movement handicap. This center affords them an individual study plan and a help of skilled tutors, assistants sign language translators. It provides courses to improve the sense perception abilities or motional abilities (especially an ability to correctly capture the technical text via Braille and sign language, the ability to use the compensating tools etc.). Teiresias center is not dedicated only to the students, but it trains also the tutors and gives them a detailed instruction, how to communicate with the handicapped student and how to teach them. These trained tutors are available for all faculties of the Masaryk University.

3. Teaching approaches for hearing handicapped students

Before we start the education, we need to get the basic information about the particular handicaps. Teaching methods for students with variety handicaps were mediated by members of Teiresias Center at Masaryk University. Through practical experience and cooperation with student we were able to define the main tools helping handicapped student to participate in standard courses. In this paper we present results of teaching/learning process of students with hearing impairment that were proved by the practical experience from the education at the Department of Physics at the Faculty of Education of the Masaryk University.

3.1. General ground

The speech is the most frequently used medium during the standard education, but the research shows, that the visual reception of the information is much more effective – see Figure (Petty, 2008).

![Normal human’s efficient information perception layout (Petty, 2008):](image)

This human’s sense perception and information retrieval layout is strongly individual. That is why the setting of the individual teaching method is always very difficult. Among people with hearing impairment there are differences even higher due to the defect or the lack of one sense (hearing). It was shown that students with hearing impairment can be divided in two groups by how the people have lost their hearing:

- Pre-lingual deafness - Loss of hearing before the language is developed.
- Post-lingual deafness - People who got deaf, when they already had learned to speak.

People with pre-lingual deafness have a different mother language, because they have not developed the language by the hearing and speaking as a child. Their mother language is the sign language and the written language is the first foreign language for them. People with Post-lingual deafness know how to speak and usually don’t lose the speaking ability. Their mother language is the same as in hearing people (Teiresias, 2010). The students with pre-lingual deafness have many problems with understanding of the subject matter because of the different language. These two languages (spoken and sign) have a different syntax. The students many times misunderstand the teacher’s statements during the lip-reading, reading and watching the notes written at the board. Therefore there is
an advantage when writer or a sign translator (mainly at the lectures) is helping them to understand the matter during lesson.

At Masaryk University students with hearing impairment (or other physical handicap) can in principle choose from two different forms of study: Integrating with other students, or individual study plan according to the handicap and after consultation with Tieresias specialists.

Integrating education – The goal is to offer a common experience with other students to the handicapped students with respect to their specific needs (Průcha et al., 2008).

Individual education – This plan is set by the teacher and the student for each semester. It contains examination terms and education forms modifications that must be agreed by the dean.

3.2. Specific modification of teaching/learning process

After an experience with the deaf students we have set a several rules, which should be followed during the education. This communication channel should not be only simplex, but for effective education we need to require some feedback from the student.

During the communication with a deaf student who is able to lip-read we need to follow these bellow mentioned rules. Some of the points are complemented with a required feedback description, which is important for the quality education. These rules can be used even in another course even though they are deduced from the experience during physics and mathematics lessons.

Table 1. Duplex communication channel: teacher ⇔ student

| #  | Teacher’s Rules                                                                 | Required student’s activity                          |
|----|--------------------------------------------------------------------------------|------------------------------------------------------|
| 1  | Preliminary information about the current issue, eventually about any changes and about the next lesson theme. | The student keeps visual contact with the teacher.     |
| 2  | By asking the checkout questions verify, if the deaf student understands the material and remains in contact with the exercise content. | Adequate responses.                                  |
| 3  | Speak clearly and keep proper tempo of the speech, use rather simple and short sentences and take a short breaks. Do not over-articulate, which could make the lip-reading difficult. Don’t speak too loud and keep the visual contact. | The student asks questions, if he doesn’t understand. |
| 4  | All the requirements must be clearly defined in advance (in written form). | In case of unclarity, student asks for more accurate explication. |
| 5  | The teacher must keep his face well viewable and shouldn’t speak from the side or back. The teacher ought to give the student a notice by touching him, if the visual contact is not kept. | If the teacher stays on a wrong position, student asks him to move. |
| 6  | Do not stay against the light. Student could be blinded and unable to lip-read. In case of reduced visibility, use the artificial lighting. | If blinded, the student asks the teacher to move.     |
| 7  | It’s advisable to take breaks every 15 minutes during the exercises. The student can’t be fully concentrated for the lip-reading after this period (Bednárová, 2010). | Concentration for the lip-reading.                    |
If the education is in sign language (with the sign language translator), we need to follow even these additional rules:

| Rule | Rule Description |
|------|------------------|
| 8    | Do not speak to the translator, but speak straight to the student. Visual contact is of course important. |
| 9    | Do not address the student in dative. Do not speak like: „Let him say.....“, „Let him do.....“ etc. |
| 10   | All the technical terminology must be written on the board. This makes the translation easier. |
| 11   | Adjust the disposition of the persons to the light conditions. In accord with the rule (No. 6) |

Setting and following the rules is strongly individual. Teachers adjust them in relation to the course, degree of the student’s impediment or classroom conditions.

There is teacher’s choice which teaching methods are elected. It is expected that lessons will be adapted to all circumstances. Expected activities are only given in the text in general. It depends on the teacher, to what extent the requirements for these activities expand. All training is much more demanding than traditional teaching.

### 3.3. Integrating education

The adopted approach is a matter of choice. From our experience we conclude that the integration approach is not very effective for teaching/learning Mathematics and Physics. The lip-reading itself causes problems and decreased the level of the student’s understanding of the subject matter. In the process of teaching, not all of the recommended principles can be applied (rules 2, 5 and 7 in particular) due to the extra time needed for putting them into practice. The student should sit in the front row to facilitate the lip-reading. The student can use a recorder when he/she is insufficiently endowed with the capacity of lip-reading.

When teacher demonstrates on the blackboard how to solve a mathematic problem the student with hearing impairment has often a disadvantage due to the teacher’s position. Indeed, the student has often low possibility to look teacher’s face and he/she starts falling behind the rest of class. This can be solving by repeating face to face either by teacher or another student. This method may lead to the disruption of a lesson. On the other hand, it can provide a useful experience to other students. Students, who use the sign language translators, usually chose individual teaching form.

Exercise Mathematics for the physics teachers at Faculty of Education is actively shared by the students. Theoretical knowledge acquired at lectures is practically applied to concrete examples and problems describing everyday situations for the easier understanding. It is more difficult to understand an abstraction for the deaf students and in this case they have also problems with practical application of the subject matter.

Integrating education has one great advantage: The student is a part of the class and other students can help him/her.

### 3.4. Individual study plan

This individual study plan is set in accordance with the student’s previous knowledge and abilities. Requirements for passing the course remain the same. The education runs in the special equipped classroom in the Teiresias center in Brno.

During the individual education in the same subject Exercise Mathematics for the physics teachers (which originally used to be directed as an integrating education) we found, that the student actively reacts to the subject matter and understands the contents much better. The gained knowledge is proved by the final tests as usual. Moreover, the teacher gets the feedback not only from the student, but also from the Tieresias center. The Teiresias specialists visit and inspect the classes. The report of teacher’s mistakes as an example of such evaluation of the lesson with the deaf student is in the text below:

- Teacher over helps the student.
- Teacher intervenes in the student’s written notes, makes numerical corrections of errors.
• Teacher helps him/she when he/she could not find the necessary information in his/her workbook. (Leave him/her alone to search for the information. The student needs to learn, how to use his notes and books for home preparation in order to successfully pass an exam).
• Teacher gives not student sufficient time for thinking and individual work.

Teaching by individual study plan has the advantage that students can respond to the current situation and this aspect contributes to better education. Among the most serious obstacles we pick up misunderstanding of terminology and abstract thinking. Apart of speaking the teacher has to write on a blackboard all the technical terms, mathematical and physical relationships. Some of the more abstract terms must be clarified.

3.5. Combination of integrating study and individual study plan

One of the possibilities how to prevent the exclusion of a student with handicap from the collective is a combination of integrating study and individual study plan. This way would allow the student to shorten study period (students with handicap can usually extend the regular period of study at Masaryk University). The disadvantage would be more time consuming. In most cases, it is almost impossible for the student to participate on the regular exercise and to fulfill an individual study plan at the same time.

4. Conclusion:

The education of the deaf students is obviously not easy. The school should propose an individual study plan and/or integrating education into standard course with some specific rules. It is necessary to prepare a teaching method according the above mentioned rules. In this paper we have tried to summarize main rules namely for mathematics and physics lessons attended by handicapped students with hearing impairment. For the effective teaching/learning process the duplex communication channel teacher-handicapped student is necessary to establish.

Teacher must not make the work easier for the students with hearing impairment. We presented also most frequent teacher’s mistakes during individual education.

The main contribution of the deaf people to the educational system is their ability to sensitively understand the needs of similarly restricted pupils or students. Therefore they, especially as future teachers, can much better convey all the information to them.

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