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The awareness of emotional states and the educational achievements of students with visual impairments during early adolescence

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The purpose of this article is to present the results of research of the relationships between awareness of one's emotions and the educational achievements of students with visual impairments during early adolescence. The study included 60 pupils from secondary schools in the region of Masovia. The study used the Emotion Awareness Questionnaire – Revised EAS-30-R. Rieffe, P. Oosterveld, A.C. Miers, M.M. Terwogt (2008) in the Polish adaptation by I. Kucharczyk and A. Dłużniewska, as well as school grades.

KEY WORDS: self-awareness, emotions, pupils with visual impairments

Introduction

Emotions play an important role in the development of every person. They influence social relations, modes of behaviour, the feeling of one's effectiveness, one's self-assessment, they enable

appropriate reactions in difficult situations. The period of adolescence is a time, when not only an emotional crisis, but also emotional instability due to hormonal changes, may occur. This is also a phase of physiological changes leading to the transformation of one's own image¹. Emotions during adolescence activate themselves depending on the stimuli in action at any given moment, and the reactions depend on the excitation and restraining processes of the nervous system².

During adolescence up, a young person becomes more and more aware of the emotions they experience and live. This is related with the process of forming and perfecting of the ability to recognise one's own emotions and the achieved social competences. This takes place thanks to the role that emotional intelligence begins to play.

The concept of emotional intelligence

The concept of emotional intelligence in scientific literature was promoted in the 1980s. Howard Gardner is considered the forerunner who indicated the presence of interpersonal intelligence (the ability to understand people) and intrapersonal intelligence permitting insight into one's own emotions, their identification and consideration during the process of making various decisions, which translates to behaviour³. This term was introduced into social sci-

¹I. Obuchowska, *Adolescencja*, [in:]: *Psychologia rozwoju człowieka. Charakterystyka okresów życia*, red. B. Harwas-Napierała, J. Trempała (ed.), Wyd. PWN, Warszawa, 2000, vol. 2, pp. 152-155; M. Radochoński, *Psychopatologia życia emocjonalnego dzieci i młodzieży. Wybrane zagadnienia*, Wydawnictwo Uniwersytetu Rzeszowskiego, Rzeszów 2009.

²R. A. Thompson, *Emotion regulation: a theme in search of definition*. "Monographs of the Society for Research in Child Development" 1994, no. 2-3, pp. 25-52.

³M. Ledzińska, *Elementy poznawcze i metapoznawcze w inteligencji – od inteligencji poznawczej do emocjonalnej*. „Psychologia Wychowawcza”, 1999, 42, pp. 1-10; H. Gardner, *Inteligencje wielorakie. Teoria w praktyce*, Media Rodzina, Poznań 2002.

ences and humanities by Petera Salovey and Johna D. Mayera⁴, and popularised by D. Goleman⁵. In the opinion of the latter, the development of a pupil depends not only on their cognitive abilities, but mainly from the level of emotional intelligence understood as a set of abilities and competences increasing one's personal and interpersonal activity shining through in social relations with others.

Despite dozens of years of research on the topic, researchers have not yet been able to come up with a joint characterisation of emotional intelligence. Some characterise it as the ability (a set of abilities) composed of four groups of abilities: the ability to perceive and express emotions; emotional abilities supporting thinking; the ability to understand and utilise emotions in various situations; the ability of conscious emotional adjustment, meaning, the processes of excitation and restraining of emotions in social situations⁶.

Others perceive emotional intelligence as knowledge, meaning, a set of experiences of emotional character integrated in cognitive structures⁷. Speaking of emotional intelligence as knowledge, one needs to remember that this knowledge is composed of information about the causes of emergence of emotions, words describing emotional states, data concerning emotional expression in social situations, the influence of emotions on the undertaken activities as well as self-awareness of emerging emotions and the modes of reaction⁸.

⁴P. Salovey, J.D. Mayer, *Emotional intelligence*, "Imagination, Cognition, and Personality", 1990, 9, pp. 85–211.

⁵D. Goleman, *Inteligencja emocjonalna. Sukces w życiu zależy nie tylko od intelektu lecz od umiejętności kierowania emocjami*. Wyd. Media Rodzina, Poznań, 2012; S. Rietti, *Emotional Intelligence as Educational Goal: A Case for Caution*, "Journal of Philosophy of Education", 2008, 42 (3-4), pp. 631-643; M. Feldmann, P. Jeffery, *Co-curricular Assessment Scale Development*, "The Journal of General Education", 2011, 60, 1, pp. 16-42.

⁶P. Salovey, J.D. Mayer, *Emotional intelligence*. "Imagination, Cognition, and Personality", 1990, 9, pp. 185–211.

⁷C.E. Izard, *Emotional intelligence or adaptive emotions?* "Emotion", 2001, 1, pp. 249–257.

⁸A. Matczak, K.A. Knopp, *Znaczenie inteligencji emocjonalnej w funkcjonowaniu człowieka*, Wydawnictwo Stowarzyszenie Filomatów, Liberi Libri. 2013.

A third group of researchers, among them Konstantinos V. Petrides and Adrian Furnham, treat emotional intelligence as a property (set of various properties). This means that each person evaluates subjectively their emotional abilities in terms of their recognition, processing and usage in various situations⁹.

The last group of researchers, e. g. Reuven Bar-On¹⁰, considers emotional intelligence to be a competence or their set. In his opinion, emotional intelligence is a set of postcognitive abilities that enable a person to emotionally handle various more or less difficult social tasks. The author also hinted at five components of emotional intelligence that are necessary to achieve social success. They include: the interpersonal component, the intrapersonal component, the adaptive component, the component permitting the coping with stress and with the mood. Emotional intelligence as a competence is also handled by D. Goleman¹¹, who had differentiated between five of its constituent components: self-awareness (meaning, knowledge of the experienced emotions), self-adjustment (meaning, the ability to control emotions), motivation to act (with the use of emotions), empathy (the ability to feel in to the emotional states of others), social abilities (the ability to make contacts with other people and to invoke specific reactions in people).

Carolyn Saarni believes that instead of the term of emotional intelligence, the term of emotional competence should rather be used. In her concept, she distinguishes between eight different constituent components, whereby some of them are referred to as abilities, and other – as skills. The author is of the opinion that these competences

⁹Wytykowska, A., Petrides, K.V., *Inteligencja emocjonalna jako dyspozycja. Polska adaptacja skali do badania inteligencji emocjonalnej jako cechy TEIque Petridesa i Furnhama*, „Psychologia, Edukacja i Społeczeństwo”, 2007, 4, pp. 97–110.

¹⁰R. Bar-On, *Emotional Quotient Inventory. A measure of emotional intelligence. User's manual*. Multi-Health Systems Inc, Toronto 1997, p. 3.

¹¹D. Goleman, *Inteligencja emocjonalna w praktyce*, Media Rodzina, Poznań, 1999; A. Jaworowska, A. Matczak, *Kwestionariusz Inteligencji Emocjonalnej INTE* S. Schutte, J.M. Malouffa, L.E. Hall, D.J. Haggerty'ego, J.T. Cooper, C.J. Golden, L. Dornheim. *Podręcznik*, Pracownia Testów Psychologicznych PTP. Warszawa 2008.

are there to help the individual in various social situations to react appropriately under the influence of emotions, but they also provide the ability to use them in interactions with others. The higher the level of one skill, the more the level of a different one will rise.¹²

Emotional intelligence is not innate, and it takes shape with age. Analyses of subject literature indicate that researchers are not unified in their opinion on the factors determining emotional intelligence. Some believe that it depends on biological factors, while a different group of researchers says that its development is influenced by social factors¹³.

To summarise, the present article assumes that emotional intelligence is a set of skills to cope in various social situations as a result of acquired abilities spanning emotions, as well as the knowledge on their subject¹⁴.

Emotional intelligence and visual impairments

The period of adolescence is a time, when a pupil is learning to cope with difficulties stemming e. g. from emotional instability. At this stage, youths have to face changes related to their perception of themselves and others, seek social approval in their group of peers, compare themselves with others. For a pupil with a sight impairment, this is a period just as difficult as for one with perfect vision.

¹²C. Saarni, *Kompetencja emocjonalna i samoregulacja w dzieciństwie*. [in:] *Rozwój emocjonalny a inteligencja emocjonalna*, ed. by P. Salovey, D. J. Slyter, Dom Wydawniczy Rebis, Poznań 1999, pp. 75–125.

¹³D. Goleman, *Inteligencja emocjonalna. Sukces w życiu zależy nie tylko od intelektu lecz od umiejętności kierowania emocjami*, Wyd. Media Rodzina, Poznań, 2012; A. Matczak, *Zarys psychologii rozwoju. Podręcznik dla nauczycieli*, Wydawnictwo Akademickie „Żak”, Warszawa, 2003.; J.D. Mayer, P. Salovey, *Czym jest inteligencja emocjonalna?* [in:] *Rozwój emocjonalny a inteligencja emocjonalna*, ed., P. Salovey, D. Sluyter (ed.), Dom Wydawniczy Rebis, Poznań 1999, pp. 23–74.

¹⁴A. Jaworowska, A. Matczak, *Kwestionariusz Inteligencji Emocjonalnej INTE S. Schutte, J.M. Malouffa, L.E. Hall, D.J. Haggerty’ego, J.T. Cooper, C.J. Goldena, L. Dornheim. Podręcznik, Pracownia Testów Psychologicznych PTP. Warszawa 2008.*

They experience the same dilemmas and social dissonances as their perfect-sighted peers. Research on the emotional intelligence of adolescents with weak eyesight or those who are blind is relatively rare both in world as well as Polish literature.

The problem of development of emotional intelligence among pupils with sight impairments was taken on by Muhammad Arshad and Muhammad Aslad Lodhi¹⁵. They have studied 30 blind pupils and 30 visually-impaired pupils aged between eight and 18 using the Emotional Intelligence Questionnaire by Bar-On EQ-1-YU, composed of 60 items subdivided into seven sub-scales (intrapersonal skills, interpersonal skills, adaptation skills, coping with stress, general mood, positive impressions and lack of consequence in behaviour). According to the authors, problems with sight exacerbate the difficulties in coping with daily challenges. Visually-impaired adolescent pupils, due to the limited resources concerning e. g. understanding their own emotions, are more sensitive, unsure of themselves, are more often than their peers characterised by reduced self-assessment and bad moods. Arshad and Muhammad Aslad Lodhi have also determined that this group is characterised by a reduced frequency of social contacts.

Studies conducted by Kumar and Singh¹⁶ on a group of 150 students with sight impairments, and an equally-sized group of well-sighted peers studying at higher education facilities in India, have brought the conclusion that students with damaged eyesight are characterised by a lower level of emotional intelligence.

The research of Rani¹⁷, in turn, concerning the emotional intelligence of visually-impaired and blind pupils conducted at special

¹⁵M. Arshad, M. Lodhi, *Congenital Blind and Sighted; Emotional Intelligence Sighted*. "The Professional Medical Journal", 2015, 22(10), pp. 1336-1344.

¹⁶S. Kumar, J. Singh, *Emotional intelligence and adjustment among visually impaired and sighted school students*. "Asian Journal of Multi-Dimensional Research", 2013, 2(8), pp. 1-8.

¹⁷R. Rani, *Emotional intelligence and academic achievement of visually disabled students in integrated and segregated schools*. "Disabilities and Impairments", 2011, 25 (1&2), pp. 44-50.

and integration schools in Delhi had shown that pupils taught at integration schools have a higher level of emotional intelligence. A correlation had been shown to exist both between the type of school as well as academic success, and the level of emotional intelligence. The above conclusions are also confirmed by the research of S. Parween¹⁸.

In the opinion of L. A. Beaty, lack of eyesight may contribute to the reluctance to undertake work in the future, low social approval, poor academic results and poor self-assessment. These difficulties among teenagers may often lead to the emergence of various psychological, mainly emotional, problems.¹⁹

Own research methodology

In order for a pupil to be able to develop themselves, they have to be provided with appropriate conditions. The educational and social environment plays one of the key roles. It allows one to explore oneself. The development of the emotional sphere conditions the development of emotional intelligence. The lack of sensory input data not only prevents, but delays the acquisition of abilities related to the analysis of the emerging and experienced emotions. This requires more self-development, but also teaches them the appropriate modes of reaction.

The purpose of the presented study was obtaining an answer to the questions: Do there exist differences in the area of school achievements between visually-impaired pupils and well-sighted pupils during adolescence, and what are these? Do there exist any relations between the self-awareness of emotional states emerging

¹⁸S. Parween, *Variables Influencing Emotional Intelligence of Visually Impaired Students in Higher Education*. "Disability Influencing Emotional Intelligence of Visually Impaired Students in Higher Education", 2015, vol. 26 (1), pp. 97-108.

¹⁹L.A. Beaty, *Adolescent self-perception as a function of vision loss*, "Adolescence", 1992, 27, pp. 707-714.

in adolescent visually-impaired pupils and their school achievements, and what are these?

Own research used the diagnostic survey method, and as the tool applied was the Emotion Awareness Questionnaire – Revised EAQ-30-R. of C. Rieffe, P. Oosterveld, A.C. Miers, M.M. Terwogt (2008) in the Polish adaptation of I. Kucharczyk and A. Dłużniewska²⁰. This questionnaire is made up of 30 items. It is foreseen for the study of awareness of own emotional states among youths aged between 12 and 17. The areas studied in the questionnaire span the following categories: *Identification of emotions* (7 items), *Verbal sharing of emotions* (3 items), *Not hiding emotions* (5 items), *Bodily awareness* (5 items), *Attending to others' emotions* (5 items), *Analyses of emotions* (5 items). The questionnaire uses the three-level Likert scale. In order to determine school achievements, the mean notes were considered that the pupils had been awarded in the individual classes.

The article below takes into account only certain constituent components of emotional intelligence according to the concept of Goleman. This stemmed from the structure and assumptions of the EAQ-30-R of C. Rieffe, P. Oosterveld, A.C. Miers, M.M. Terwogt utilised in the research below. Goleman had distinguished between five components of emotional intelligence (these being: self-awareness of emotions, self-adjustment of emotions, motivation to act, empathy, social skills). In questionnaire EAQ-30-R, in turn, the authors had distinguished the areas of *Identification of emotions*, *Verbal sharing of emotions* and *Analyses of emotions* as the counterpart of

²⁰The reliability of the EAQ factors was checked by determining their internal coherence and absolute stability. The coefficients of coherence and stability were between 0.74 and 0.77. The questionnaire was translated into Polish and adapted in the scope of the research project titled *Emotional self-awareness and social competences as compared to educational achievements among lower secondary school youths with and without specific learning difficulties* („Samoświadomość emocji i kompetencje społeczne a osiągnięcia edukacyjne młodzieży szkół gimnazjalnych z i bez specyficznych trudności w uczeniu się”) financed by the Maria Grzegorzewska Paedagogical University in Warsaw (BSTP WNP 16/17 I). During the conducted study Cronbach's α internal coherence coefficient exceeded 0.8.

Goleman's self-awareness; *Not hiding emotions* as the counterpart to self-regulation. Both D. Goleman as well as C. Rieffe, P. Oosterveld, A.C. Miers, M.M. Terwogt had distinguished *Empathy*. In addition, the factor of *Bodily awareness* was used, but the components of social skills and motivation to act, as indicated by Goleman, were not indicated.

Organisation and area of research

The conducted study spanned 30 pupils with visual impairments (persons with poor eyesight with a sight sharpness in the range of 0.03 to 0.01 without additional feedback) and 30 well-sighted pupils.

27 visually-impaired pupils attend the Zofia Galewska Special School and Education Facility in Warsaw, three pupils attended a general public integration school in Warsaw. The well-sighted pupils attended a general public lower secondary school in Warsaw. The choice of persons for the first group was purposeful (the group was selected to include visually-impaired pupils), and for the group of the well-sighted - random.

The groups were chosen so as to be equal - from 1st grade of the lower secondary school - seven pupils each; from 2nd grade - 11 pupils each, and from 3rd grade - 12 pupils each. The study was conducted in the period of February and March of 2017.

Results analysis and interpretation

Table 1 shows data concerning the descriptive statistics of the individual factors of questionnaire EAQ-30-R foreseen for the study of emotional awareness. A detailed analysis of the numerical data obtained in the research process lets one show that visually-impaired pupils had achieved the highest results of all six factors in the area of *Analyses of emotions* (the mean achieved result is 2.500;

Table 1. Descriptive statistics achieved by the analysed pupils per the Emotion Awareness Questionnaire – Revised EAS-30-R. C. Rieffe, P. Oosterveld, A.C. Miers, M.M. Terwogt (2008)

| Factor | Pupil group | N | M | SD | M:M _{max} in % | r. min. | r. max | X _{typ} (M±SD) | k | g |
|-------------------------------|-------------|----|-------|-------|-------------------------|---------|--------|-------------------------|--------|-------|
| Identification of emotions | PVI | 30 | 2.100 | 0.547 | 70.00 | 1.20 | 3 | 1.553-2.647 | -1.02 | .081 |
| | WSP | 30 | 2.15 | 0.579 | 71.66 | 1.14 | 3 | 1.195-3.385 | .819 | 1.628 |
| Verbal sharing of emotions | PVI | 30 | 1.800 | 0.610 | 60.00 | 1 | 3 | 1.190-2.41 | -.380 | .514 |
| | WSP | 30 | 2.222 | 0.555 | 74.00 | 1 | 3 | 1.667-2.777 | -.610 | -.145 |
| Not hiding emotions | PVI | 30 | 1.995 | 0.460 | 65.00 | 1 | 2.86 | 1.535-2.460 | -.322 | .112 |
| | WSP | 30 | 2.353 | 0.405 | 78.43 | 1.6 | 3 | 1.948-2.758 | -.813 | .181 |
| Bodily awareness | PVI | 30 | 1.646 | 0.483 | 54.86 | 1 | 2.6 | 1.163-2.129 | -1.07 | .427 |
| | WSP | 30 | 2.193 | 0.652 | 73.10 | 1 | 3 | 1.541-2.845 | -1.44 | -.140 |
| Attending to others' emotions | PVI | 30 | 1.793 | 0.513 | 59.76 | 1 | 2.6 | 1.28-2.306 | -1.215 | .833 |
| | WSP | 30 | 2.273 | 0.447 | 75.76 | 1.4 | 3 | 1.826-2.72 | -.526 | .179 |
| Analysis of emotions | PVI | 30 | 2.500 | 0.447 | 83.33 | 1.8 | 3 | 2.053-2.947 | -1.415 | .833 |
| | WSP | 30 | 2.233 | 0.100 | 74.43 | 1.2 | 3 | 2.133-2.333 | -1.293 | -.131 |

Explanations to the table: PVI – pupils with visual impairments; WSP – well-sighted pupils; M – arithmetic mean; SD – standard deviation; r. min. – lowest result achieved for the factor; r. max. – highest result achieved for the factor; X_{typ} – border of typical area; k – curtosis; g – skewness (distribution asymmetry coefficient)

Table 2. Differences in the mean grades achieved for individual classes for the analysed group of adolescent visually-impaired pupils (N = 30) and well-sighted pupils (N = 30)

| Variable | Pupils with visual impairments (N = 30) | | Well-sighted pupils (N=30) | | t | df | p |
|---------------------|--|-------|-------------------------------|-------|--------|----|--------|
| | M | SD | M | SD | | | |
| Conduct | 3.766 | 1.040 | 4.793 | 1.322 | -3.342 | 58 | 0.001* |
| Polish | 2.700 | 1.055 | 3.016 | 1.163 | -1.104 | 58 | 0.273 |
| Foreign language | 2.766 | 1.194 | 3.00 | 1.159 | -0.768 | 58 | 0.466 |
| History | 2.666 | 0.088 | 3.233 | 1.330 | -1.943 | 58 | 0.057* |
| Geography | 2.866 | 0.899 | 3.536 | 0.905 | -2.875 | 58 | 0.006* |
| Biology | 3.100 | 0.994 | 3.250 | 0.953 | -0.596 | 58 | 0.553 |
| Chemistry | 2.356 | 0.615 | 3.133 | 0.964 | -3.718 | 58 | 0.001* |
| Physics | 2.566 | 0.552 | 3.183 | 0.951 | -3.070 | 58 | 0.003* |
| Mathematics | 2.500 | 1.042 | 3.050 | 1.020 | -2.066 | 58 | 0.043* |
| Computer science | 3.646 | 0.802 | 5.233 | 0.597 | -8.681 | 58 | 0.000* |
| Art | 4.420 | 0.829 | 3.193 | 1.013 | 5.130 | 58 | 0.000* |
| Technical education | 4.613 | 0.808 | 4.866 | 0.776 | -1.238 | 58 | 0.022* |

Clarifications to the table: M - arithmetic mean; SD - standard deviation; t - Student's t-test result; df - degrees of freedom; p - significance level; * statistical significance of 0.01

SD = 0.447; minimum result - 1.8; maximum result - 3). The lowest result in turn was achieved in the area of *Bodily awareness* (M = 1.646; SD = 0.483; minimum result - 1; maximum result - 2.6). In the group of well-sighted pupils, these values are slightly higher. The highest value was achieved in the factor of *Not hiding emotions* (M = 2.353; SD = 0.405; minimum result - 1,6; maximum result - 3), and the lowest in the factor *Identification of emotions* (M = 2.15; SD = 0.579; minimum result - 1,14; maximum result - 3).

A further item under analysis is the determination of the significance of statistical differences in the mean achieved for grades in the individual classes for pupils with visual impairments and well-sighted pupils (table 2). Considered were the mean grades achieved by the pupils for the end of the winter semester in the 2016/2017 schoolyear.

Pupils with visual impairments had achieved the best grades in *Technical education* (M = 4.613). It is lower than the result of well-sighted pupils by 0.253. The second place was taken by results in *art* (M = 4.420) and it is at the same time the only class, in which visually-impaired pupils obtain better results than well-sighted peers, by 1.227.

The best means were achieved by visually-impaired pupils in *chemistry* (M = 2.356) and it is lower than the result for well-sighted pupils by 0.777; *mathematics* (M = 2.500) and *physics* (M = 2.566). These grades are typical exact sciences requiring from the pupils attention, but also observation of detail, focus on changes in events, changes in signs in calculations and great precision. A visually-impaired pupil is not always able to precisely focus mathematical calculations, because using magnifying glasses or equipment, they may not remember the individual signs, changes of symbols, and it is easier for them to lose track in the volume of calculations. They also require more time to read the mathematical, chemical or physical formulae.

The highest difference in the achieved mean grade between the groups was in *Computer science* and it is 1.587 in favour of the well-sighted pupils (visually-impaired pupils had achieved a mean result

of 3.464; the well-sighted $M = 5.233$). Computer science is a class, where pupils learn to search for, collect and process information from various sources, processing of images, texts, numerical data, motifs, animations, multimedia presentations, furthermore to solve algorithmic problems. A pupil also gets to know various programming languages, or code. It is sufficient to omit a single character in a code, for the entire procedure to be required to be written anew. For a visually-impaired pupil, this is not only difficult, but also very tiring in terms of the amount of eye sight work on specific material.

Statistical calculations concerning the mean results in the individual classes, as achieved by adolescent visually-impaired and well-sighted pupils indicate that there exist statistically significant differences in the area of such classes as *geography* ($t = -2.875(58)$; $p < 0.006$); *chemistry* ($t = -3.718(58)$; $p < 0.001$); *physics* ($t = -3.070(58)$; $p < 0.003$); *mathematics* ($t = -2.066(58)$; $p < 0.043$), *computer science* ($t = -8.681(58)$; $p < 0.000$). However, results in the area of the mean in *history* are at the limit of statistical significance ($t = 1.943(58)$; $p < 0.057$). More information on this subject is yielded by the analysis of the obtained material, conducted based on the arithmetic means. Visually-impaired pupils had achieved worse results in all the listed classes. This may be caused by the fact that during these classes, the main requirement is work using sight, e. g. when writing down chemical formulae, substitution and changing of signs in equations, sketching out function graphs, designating vectors, which is possible if one organises their work space on paper well. The situation may wonder that in such a class as geography, visually-impaired pupils had achieved results worse by 0.67 of a grade. Geography does not require the sketching of graphs, indeed, but it is work with a map. Just like in physics, good spatial orientation in order to locate a specific place is required, meaning that not every visually-impaired pupil is able to cope with this.

In analysing the mean results, one can note that in the area of *technical education*, the groups of visually-impaired pupils and well-sighted pupils differ significantly ($t = -1.238(58)$; $p < 0.022$). In the group of visually-impaired pupils, a significantly lower mean result

($M = 4.613$) was recorded as compared to the group of well-sighted pupils ($M = 4.866$). The base curriculum indicates that this is a class, during which pupils learn about and understand the need to construct various model types, develop solutions for typical technical problems emerging during design (draw block diagrams, compare the functions of the models built, present sketches), develop detailed design solutions, design e. g. models of various complexity levels, learn to use model design tools and equipment, and let the models they built run, if they build such models. Technical education classes can take the form of sewing, electronics, manual work. Noteworthy is the fact that irrespective of the form of the technical class, all require the use of sight from pupils. In case of visually-impaired pupils, these abilities are lower, the work progress speed is often reduced due to the time required to visually acquaint one with fine components. Technical classes require a very high degree of precision and exactness, measuring, calculating and checking whether each element, e. g. of a constructed model, is suitable with the rest. A visually-impaired pupil is not always able, even with the support of modern optical and non-optical equipment, to state whether their model does not work, at what point were the elements wrongly connected, and why fine components don't fit in with each other.

Considering the results of Student's *t*-test, one notes that in terms of the *art* class, a statistically significant difference exists between the visually-impaired and well-sighted groups ($t = 5.130(58)$, $p < 0.000$). Visually-impaired youths, compared to well-sighted youths, have achieved higher mean results in this class. The curriculum indicates that this class should be either related to one type of art or be interdisciplinary; this can be a class in visual arts, music, or a theatre group. The art class can be conducted in the form of a project or regular classes, depending on the abilities and resources of the school, as well as the interests of the pupils. As the study was conducted at a special education facility and a general public lower secondary school, visually-impaired pupils and well-sighted pupils were able to participate in differently-profiled classes, hence the

disparity of the mean results for the benefit of the visually-impaired. One needs to remember that the group of visually-impaired can be very varied – the sight sharpness for the visually impaired can range from -0.03 to $+0.05$. This causes certain pupils to only require e. g. a magnified image, with others unable to work using their eyes for longer than 30 minutes, requiring a break from visual stimuli afterwards. If visually-impaired pupils had developed their graphic design skills in art classes, creating works that did not require the usage of eyesight (usage of techniques not requiring sight), relying instead on the other senses, hence they were able to receive better grades in this class than well-sighted pupils. The well-sighted receive over 80% of their data from visual data. If they are supposed to work e. g. with clay, it could turn out that it is a very difficult task for them, and lacking the feeling of visual security may hamper the development of expression. Should the art class be related to music, then the visually impaired could utilise their good auditory memory, which may also contribute to them getting better results than the well-sighted pupils.

There also exists a statistically significant difference between the two groups in terms of conduct ($t = -3.342(58)$, $p < 0.001$) in favour of sighted pupils. This may be that visually-impaired pupils do not always behave according to standards approved at a specific school, which causes a reduction in the conduct grades. Their socially unacceptable conduct need not necessarily stem from the lack of knowledge of social norms, but of the failure to imagine what would happen should they behave in this or that way, and the lack of foresight. A different explanation may be the fact that visually-impaired pupils have fewer chances to observe various modes of behaviour due to their limited field of vision.

An amendment to the analyses on the relationship between self-awareness of emotions and school achievements of visually-impaired and well-sighted pupils is the determination of statistically important relations in place between the individual variables.

The group of pupils with visual disabilities shows four significant relations. There exists a moderate negative, statistically signi-

ficant relationship between the level of *Not hiding emotions* and results from the *chemistry* class ($r = -0.528$; $p < 0.003$) and a negative, low, statistically significant relation between the level of *Not hiding emotions* and the results in *computer science* ($r = -0.365$; $p < 0.048$). Such relationships may indicate the fact that the better grades pupils achieve in these two exact science classes, the more probable it is that they have greater fear of disclosing their emotions. They do not want to show their emotions, because they fear the teacher's reactions. Whereby the level of *Bodily awareness* on the one hand and such classes as *computer science* ($r = -0.365$; $p < 0.48$) and *art* ($r = -0.365$; $p < 0.48$) show negative, low, statistically significant relations. This means that the better grades visually-impaired pupils get in these two classes, the less do they analyse the ways their bodies act, as they focus on the success, meaning, the good grades, not concentrating on the way their bodies react.

In the group of adolescent well-sighted pupils, there exists a negative, low, statistically significant relation between the level of *Not hiding emotions* and the results achieved in such classes as *Polish* ($r = -0.384$; $p < 0.040$) and *foreign language* ($r = -0.366$; $p < 0.046$), and there exists a negative, moderate, statistically significant relation between the level of *Bodily awareness* and the results achieved in *biology* ($r = -0.413$; $p < 0.023$).

Summary and conclusions

The purpose of the presented study was to determine, whether there exist differences in the area of school achievements between visually-impaired pupils and well-sighted pupils during adolescence, and what are they; and whether there exist any relations between the self-awareness of emotional states emerging in adolescent visually-impaired pupils and their school achievements, and what are these?

The analysed results indicate that there exist statistically significant differences between visually-impaired pupils and their well-

sighted counterparts in the period of adolescence in terms of the following classes: *history, geography, chemistry, mathematics, physics, computer science, art* and *technical education* as well as *conduct*. Beside art, visually-impaired pupils had received worse grades than their peers. The reasons need to be searched for in the fact that they often need to make use of various assistance tools in order to understand the relevant content. In addition, the usage of maps, e. g. during history or geography, when one is not able to look at an image globally but instead needs to subdivide information into parts, may hinder the encoding of data. Chemistry, physics and mathematics are exact sciences requiring the pupil to note rows of digits, changing signs, and also have a global overview of the row of digits and symbols, vectors and diagrams. A pupil with limited visual perception may mainly focus on attempts to read the relevant strings using optical and non-optical aids, instead of focusing on a solution.

The analysed results indicate that for the studied adolescent visually-impaired pupil group, there exist statistically significant relationships between the level of *Not hiding emotions* and the level of *Bodily awareness* and the school results achieved in such classes as chemistry, computer science and art. The better results pupils achieve in these classes, the bigger fear may emerge of disclosing their emotions.

In relation to the above, it is very important to support pupils by drawing up appropriate aid in terms of schemes, classes, workshops concerning the discovery of the experienced emotions. It would also be appropriate to arrange training seminars to show how the body reacts in various situations, both the pleasant, as well as the difficult, stressful ones. Pupils, by conducting various chemical experiments, or succeeding in computer science, have a greater need to disclose their emotions, and become more aware in this area. A similar situation may also apply to art classes. Hence, it is advisable to provide visually-impaired pupils with opportunities to express themselves and for them to attempt to understand what they are feeling.

The cognition of, understanding of and the ability to analyse the experienced emotions is very important in the process of shaping of relationships with others, creation of relations, acquisition of competences useful in adult life. The self-awareness of one's own emotional states permits self-development, improves the ability of one's own effectiveness and one's self-assessment. Hence, educational and rehabilitation facilities, where adolescent pupils learn, should not only convey knowledge on the base curriculum, but should also take into account the emerging emotions, and provide the ability for them to be expressed, in order for attempts at their understanding to be made.

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