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Aspects of Kodály's Music Pedagogy



Summary

Zoltán Kodály's principles in music education have had a major international influence across the world. He is universally recognized as one of the greatest figures in music teaching. Zoltán Kodály was a Hungarian composer, folk music researcher, and a pioneer in music education. Zoltán Kodály believed that musical aptitude is a characteristic of every person and that, ideally, a music education should begin as early as possible in a person's life – first at home and later within the school curriculum. Kodály elaborated the structured and sequential system of music education that would make music accessible to all students in Hungary. His concept has gained international interest and remains in use in many countries' music education, not only in Europe, but all over the world. On the basis of his concept we tested students' music reading skills with the aid of the latest computer-based assessment technologies.

Keywords: Kodály concept, music education, literacy, assessment

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INTRODUCTION

*“There is no complete spiritual life without music, for the human soul has regions which can be illuminated only by music”
(Zoltán Kodály)*

Music education in Hungary is based on the well-known Kodály concept. Zoltán Kodály considered it vital that music education should begin at the youngest possible age. Kodály's ideas on how a child should be educated lie in the belief that arts, particularly music, should be at the centre of education. Kodály's pedagogy emphasizes the development of music literacy through the innate music of the culture, beginning with folk songs that he rated alongside the works of classical composers. Zoltán Kodály created reading and singing exercises for practicing from primary to professional levels; he claimed that music reading and writing (like the alphabet) can be learnt by anyone. Kodály wrote numerous articles and essays on his educational concept and gave many speeches at international conferences. He stressed that the goal is not only to teach music, but also to improve teaching techniques (Király, 2012). In all his pedagogical writings, Kodály emphasizes that music should have a central role in education. According to the Kodály concept, musical training should be an integral part of the general curriculum and music should not only be accessible to the elite, but for everyone.

Over the years many thousands have gone to Hungary to study the Kodály concept of music education, which is applied in five continents. Although the application of Kodály's ideas on music education in Hungary is rooted in Hungarian folk music, his concept is easily adaptable to the folk music of any other nation.

Although a great number of music students learn music reading, only a few studies have tried to examine its teaching and there has been no comprehensive examination of this issue. Our assessments were carried out using computer-based musical assessment tools. The purpose of our cross-sectional studies, which were conducted on a national sample, were to measure the success rate and evaluate music reading skills acquired from public and specialised music education based on the Kodály concept.

THE HISTORICAL ROOTS OF MUSIC EDUCATION

Music has existed throughout human history and forms an integral part of the cultural heritage of human societies. Music-making is one of the most ancient human activities, and human musical ability has a long evolutionary history (Morley, 2002). Music and language skills enabled the emergence of modern human social and individual cognitive flexibility; both music and language can be regarded as subcomponents of the human communicative toolkit (Cross, 1999). Humans have long been using sound to enhance their communication, and *song* may have been the earliest form of speech (Ulbaek, 1998). This form of communication had both melody and

rhythm. Darwin (1871) argued that musical capacity developed from the tones used in passionate speech and he claimed that music contributed to the development of language. Darwin connected music to strong emotions, as many animals make noises to attract mates, express emotions and communicate with others.

The other important role of music is related to spirituality, where music played a mediating role between individuals exposed to natural forces and supernatural powers. In this particular world, both the rituals and music/music making served the world concept of communities and their fate. Since ancient times, music has been regarded as having a divine origin by many peoples. There are legends in different civilizations about its magical powers. It became one of the most important means to express human emotions. It influenced the life of different societies, and still has an effect on some of them even today.

The relevance of music pedagogy comes from the ideas discussed above. Two major world civilizations which think about music in the same way, despite the apparent differences between them, will be taken as examples. In ancient China, it was thought that perfect music was one of the keys to maintaining order in the empire. Music making based on the *Yellow Bell* and on the system derived from it was of crucial importance. It was assumed that mistuned instruments and imperfect melodies could cause the collapse of the whole empire. Therefore, strict rules were introduced in the field of music. So in China the impact of music on society was its most important aspect.

In his work entitled *Republic*, Plato, one of the most well-known representatives of ancient Greek culture, which is one of the most important roots of European civilization, said: "Musical training is a more potent instrument than any other, because rhythm and harmony find their way into the inward places of the soul, on which they mightily fasten, imparting grace, and making the soul of him who is rightly educated graceful, or of him who is ill-educated ungraceful."

Christian Europe in the Middle Ages considered music of crucial importance, especially Gregorian chant, which was the primary spiritual means of expression during different liturgies. Besides reading, singing was the most important school subject in the Middle Ages.

The musical guidelines of the medieval Hungarian church, the musical training in monastic schools and the teaching of Gregorian chanting in the parishes of villages were the foundations of the culture of everyday singing. According to László Dobszay, a Hungarian peasant in the Middle Ages could sing 150-200 hours of musical material by heart.

The practice of singing was enriched later in the Renaissance, especially in the educational institutions that belonged to bishoprics and archbishoprics founded in the Middle Ages. The period from King Sigismund, through King Matthias and Queen Beatrix, to Louis II of Hungary revived the instrumental and vocal life of the secular music of the country, which gained a reputation all over Europe. The Ottoman occupation of Hungary and the division of Hungary into three areas had a considerable influence on musical life and training; however, music and instrumental education developed further where it was possible, e.g. in schools run by the Evangelists, Protestants, Piarists and Jesuits. Furthermore, music and singing, alongside astronomy and

mathematics, were part of the subject-structure developed by János Apáczai Csere, who worked in Transylvania.

Ratio Educationis, the first school reform introduced during the reign of Maria Theresa in 1777 had an effect on music teaching in Hungary in the 19th century, which took place in the so-called 'national schools'. The increasingly popular music associations and foundations also established many music schools. These institutions became increasingly popular among the emerging middle classes: one of them was the National Music Association of Pest-Buda established in 1840. The milestone of Hungarian music education was the establishment of the Royal National Hungarian Academy of Music founded by Franz Liszt in 1875, and where Béla Bartók and Zoltán Kodály studied.

Towards the turn of the century, many orchestras and singing societies were formed. Foreign musicians or musicians repatriating after having studied abroad also helped to found them and contributed to the growing number of music teachers. Church choirs and singing societies established their first national organization in 1867 and played an important role in laying the foundations of Hungarian choir life in the 20th century. The National Hungarian Singing Society was founded by Ferenc Erkel in Pest in the same year.

In the first decades of the 20th century the contradictions of the Hungarian music life became apparent. Two of them were related to German culture: the first one was the Wagner cult, and the other one was Liedertafel, which hindered the development of high-quality choir music. The third contradiction was the *nóta*, which is a form of 19th century Hungarian popular song. It started to drive out the folk songs not only in small towns but also in villages. Another problem was that the *csárdás* and *verbunkos* (18th century Hungarian dances) began to lose credit after the death of the great romantic composers due to their less talented followers.

Although the Minister of Religion and Education Kuno von Klebelsberg had a positive influence on musical life after the Great War, some of its basic problems remained unsolved.

'PRAECEPTOR HUNGARIAE' – THE EDUCATOR OF HIS NATION

*"We should remain Europeans in Hungary,
and we should be Hungarians in Europe"*
(Zoltán Kodály)

Kodály expressed at Eötvös College his aim to become the Educator of his Nation (*praeceptor Hungariae*). Kodály (who was by that time already world famous due to his composition *Psalmus hungaricus*) took his first step on a difficult journey towards becoming a *praeceptor Hungariae* by working for the development of the people and the nation; this was a result of his realising the importance of music education in public schools in 1925. His field activities grew and broadened from this period onwards. A simultaneous multi-front fight in different fields (such as society and politics) and at different levels was required, but all of these can be traced back to a single major,

common aim: the education of the people and the nation. The essence of it was that he was able to merge both ‘European existence’ and ‘the Hungarian world’, past and present, music traditions and the new wave of western European musical trends. By doing so, he created a synthesis of East and West not only in music but also more broadly in culture. This kind of synthesis set an example for others to follow. He created a new Hungarian music, and together with it our national self-image from our ancient musical culture’s language and soul. Kodály’s ideas are still topical. A majority of these might not strictly be connected to music, but they refer to a wider social context. For example, his ideas on school education, general taste and preserving national values and, furthermore, the intention of doing something for the nation such as saving Hungarian language culture from decline. Similar ideas of Kodály’s that often reappear are the discussion on how we can get rid of our ‘Hungarian illnesses’ – such as laziness, envy, disagreement, and hostility – the determination to refuse of any kind of extreme politics, the problems of morality and solidarity, and the necessity to show our European and Hungarian features together.

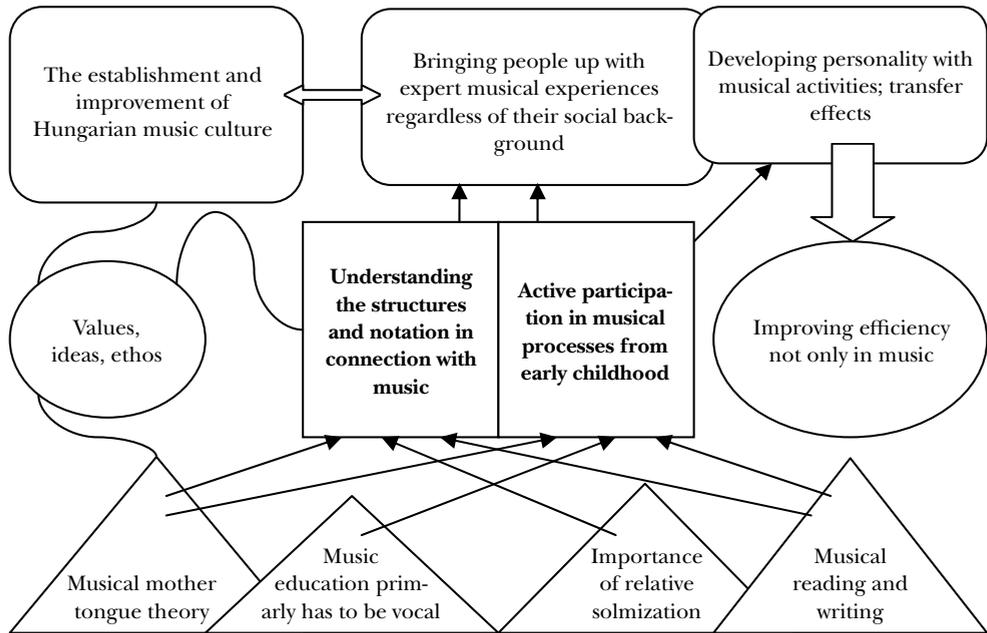
THE KODÁLY CONCEPT

*“Music should belong to everyone!”
(Zoltán Kodály)*

Gönczy (2009) created the hierarchical illustration of the main elements of Kodály concept following Ittész, who highlighted four principles (2004) which define the essence of Kodály’s ideas: 1) all children should receive music education; 2) the foundations of music education are the human voice and singing; 3) music should be encountered with respect for the principles of value-orientation, and musical mother tongue is the guarantee of this; 4) the prerequisite for educating music experts is the acquisition of musical literacy (music reading and writing) with the use of relative solmization. The application of the relative sol-fa syllables can serve as a memory aid for reading pitch. The principles listed can be interpreted in several categories, and with each other in a hierarchical relationship. Figure 1 presents this model.

The idea of “Music should belong to everyone!” and Kodály’s aim to educate the public determined his life’s work. His social activities, musical work, pedagogical writing and his compositions (e.g. choral works) all belonged to it. When he first became acquainted with English choirs in 1927, he realized their importance, their balancing role in society and their capability to create a harmonised collective life. We should also mention Jenő Ádám, who helped to put into practice what he called the ‘Hungarian method’, which is also widely-known as the ‘Kodály method’. It was Kodály who wrote the preface to Jenő Ádám’s book entitled *Systematic Singing Teaching Based on the Tonic Sol-fa* (written in 1944), which laid the foundations for present day Hungarian singing teaching. In this book it became clear that he – along with Kodály – regarded the Hungarian dramatic folk plays and folk songs as the foundations of his method.

Figure 1: Hierarchical illustration of the main elements of the Kodály concept



Source: Gönczy, 2009

Ádám adopted the most important elements of earlier music pedagogical methods (e.g. the hand signs of John Curwen and the tonic Sol-fa related to Curwen's concept of solmization) and modified some of them (e.g. the rhythm names invented by the Frenchman Émile Chev ) making them simpler and more logical.

The series of music course books for pupils in years 1-8 written by  dm and Kodly between 1947 and 1948 was withdrawn from public education in 1950 because it did not meet the requirements of the socialist regime. The reason for this was the message of the new national curriculum for music teaching which was introduced in the same year: "the shaping of the socialist character with the help of music teaching".

Unfortunately, the B k s-Tarhos Singing School led by Gy rgy Gulys was closed in 1954 although it proved to be a successful initiative at a professional and socio-political level. Kodly stood up in protest against the decision, without success.

The closing of the other singing schools, publishing companies (Magyar K rus Kiad ), and journals (* neksz * and *Magyar K rus*) and the nationalisation of denominational schools had a negative effect on singing education and the choir culture in Hungary. Despite these difficulties, the works of Kodly and  dm and their concept and method survived these hard times, even past the end of socialism in Hungary. At the same time, there were contradictions in socialist educational policy. For example, the radio programme * nekl  Ifjsg* ('The Singing Youth'), which was aired from 1934, was cancelled, while a new programme *Iskolai  nekkarok a Magyar Rdióban*

(‘School Choirs on the Hungarian Radio’) was broadcast from 1946. In addition, a new journal *Énektanítás* (‘Singing Teaching’) appeared in 1958 after the closing of all the others.

THE ROLE OF KECSKEMÉT IN MUSIC EDUCATION

Kecskemét had an important role in the music pedagogy of the 20th century, when Hungarian and the Western European musical compositions formed the basis of the music education in the town. The chief labour was undertaken by Pál Bodon, the head teacher of the music school and the choir leader Zoltán Vásárhelyi, who played a crucial role in laying the foundations of the world-famous Hungarian choir culture with his own choir. Their capacity to work capacity can be illustrated by the fact that the *Városi Dalárda* (the local singing society) learned Kodály’s three newly composed masterpieces (*Akik mindig elkésznek*, *Öregék* and *Jézus és a kufárok*) within five weeks! Zoltán Kodály asked Vásárhelyi and his choir to conduct the premieres of *Molnár Anna* and *Magyar Nemzet* and he always admired Vásárhelyi’s work.

Music and singing teaching were considered of great importance in nursery and primary teacher training in Kecskemét, and they had an important role in the musical life of the town. The 65th birthday of Kodály, when he was awarded honorary citizenship, was a turning point in the life of Kecskemét. He first saw at a gala concert the music kindergarten children of Márta Szentkirályi, the teacher at the Practice School of the Teacher Training College of the Reformed Church.

Following Kodály’s advice, the concept of a special music school was developed. This music primary school became a model in Hungarian music teaching and education. Through Kodály’s good offices, teaching at this institute started in 1950, and it has acquired an international reputation. The teacher at the practice school of the Teacher Training College became the legendary head teacher of the music school. At the same time, the music kindergarten, which had close ties with the Teacher Training College, also gained in popularity. Furthermore, the world-famous Katalin Forrai was elected honorary professor of the Teacher Training College of Kecskemét after 10 years of harmonious cooperation. The folk music researcher, church musician, composer and chorister Dr Lajos Kálmán also joined the institute and was awarded honorary citizenship of Kecskemét.

The ideas of Kodály, and the success of the Kodály School turned the limelight on Kecskemét. The first Kodály Seminar was organized in the summer of 1970. The Zoltán Kodály Institute for Music Pedagogy was established and teaching started in 1975. In the same year the International Kodály Society was founded. In 2005 the Zoltán Kodály Institute for Music Pedagogy joined with the Franz Liszt Academy of Music. A three-year integrated training course for nurse and primary school teachers started at the Institute for Preschool Teachers in 1983.

The Teacher Training Faculty has offered courses in English for international students since 2005. The Kodály and Contemporary Hungarian Music Education programme contributes to the popularity of Kodály and Hungarian music pedagogy.

THE TRANSFER EFFECTS OF KODÁLY'S MUSICAL TRAINING

*“Music is the manifestation of the human spirit,
similar to a language. Its great men have conveyed to
humanity things unutterable in any other language”
(Zoltán Kodály)*

The relevance of music education and the transfer of musical skills have been proved by numerous studies. Music making (playing an instrument or singing) has a significant effect on other important cognitive, affective and metacognitive domains. Although the social role of music has changed a lot by the 21st century, choral singing and the playing of instruments still have a remarkable positive effect on group cohesion, communication skills, social competence, cooperation, problem solving and emphatic skills (Hagen–Bryant, 2003; Gerry–Unrau–Trainor, 2012). Previous studies also indicated positive transfer effects for musical abilities on mathematics (e. g. Schmithorst–Holland, 2004). Playing or singing from notation requires mathematical thinking-related processes to sub-divide beats and turn rhythmic notation into sound (Hallam, 2010).

The human brain has the potential to reorganize its neural networks. As a result of the effects of musical perception, neural structures are rearranged (Bever–Chiarello, 1974, in Janurik, 2008). These activities involve a much larger brain region than the simpler verbal activities. Music instruction for children at an early age activates abundant and efficient connections, resulting even in increased size of the activated brain areas (Flohr–Hodges, 2002). Altenmüller and Gruhn's (2002) results suggest that musical expertise influences auditory brain activation patterns. They claim that changes in these activation patterns depend on the teaching strategies applied. So the brain structures involved in music processing reflect the personal experiences accumulated over time.

In the 1960s, Zoltán Kodály encouraged a four-year, multi-institutional study launched by Klára Kokas that systematically tracked children who regularly studied music in school. The results showed a better outcome for children involved with music activities in arithmetic, writing, and creative problem solving and in the area of movement in contrast with their peers in normal education (Barkóczi–Pléh, 1982). This exploration of musical education pointed out the transfer effects of the Kodály concept and proved that regular musical activity results in a positive change in other non-designated areas of knowledge (Kokas, 1972). The results imply that music education might have a possible compensatory effect in the development of creativity and the modification of the structure of intelligence. Correlations between creativity and intelligence also increase due to musical education, with regard to the relationships between personality and intellectual performance; the results suggest that high creativity is combined with emotional sensitivity and inner control in children exposed to more music, and they tend to mobilise energy and activity in the convergent tasks requiring more disciplined thought (Barkóczi–Pléh, 1982).

FOLK MUSIC IN THE KODÁLY CONCEPT

“Hungary is an integral part of Europe: its tradition has to live. The purpose in the life of a country and a people situated at the point of impact between East and West can only be to belong to both, and to smooth out and blend the contradiction between the two.. We can and must learn from the musical culture of all nations. Isolation and lack cultivation can dry out the national traits as well”
(Zoltán Kodály)

Kodály believed that every nation has a body of suitable folksong material for teaching music, so it should be simple to use folk songs during singing lessons. Hungarian folk music feeds from multiple sources and it was affected by the music of other nationalities. Kodály’s children’s choruses are based on Hungarian folk songs, like the first one from 1925, when Kodály’s interest turned toward music education (*Villő and Túrót eszik a cigány / The gypsy is eating cottage cheese*). Kodály’s pedagogy emphasizes developing music literacy through the innate music of the culture, beginning with folk songs that he rated alongside the works of classical composers.

Zoltán Kodály composed reading and singing exercises for practicing from primary to professional levels. He claimed that music reading and writing (like the alphabet) can be learnt by anyone. In Hungarian music education, sol-fa lessons are primarily built on the pedagogical compositions of Kodály. These works not only improve music reading and writing, musical memory or intonation, but they also introduce students to joint musical activities such as group or choir singing via valuable music material.

MUSIC LITERACY INSTRUCTION

“Often a single experience will open the young soul to music for a whole lifetime”
(Zoltán Kodály)

Written language is a relatively recent cultural invention which came into existence some 5000 years ago (Rayner–Pollatsek, 1989; in Csapó–Csépe, 2012), but remained the privilege of only small proportion of the world population until a few hundred years ago. Almost 90 per cent of all children can learn to read alphabetic as well as non-alphabetic scripts and write fluently without obvious problems (Csapó–Csépe, 2012). In all cultures word literacy preceded music literacy. The earliest known musical notation is based on the alphabetic principle of one pitch represented by one symbol. The notational methods in most cultures share similarities, with many of them being alphabetic notations, using words, syllables, or letters to stand for single sounds or a

fixed pitch (Cole, 1974). Guido of Arezzo initiated the use of a staff of four horizontal lines. He also placed the letters C or F in their appropriate places at the beginning of each line, further refining the accuracy of the system. Bar lines, expression signs, and Italian terms to indicate tempo and dynamics came into use in the 17th century. By about 1700, the modern system of notation, using a staff of five lines had become firmly established.

Music literacy is traditionally defined as an acquired musical knowledge and a skill to translate notation into vocal sound (reading/singing) and sound into notation (notating/ writing). Thousands of pieces of researches have dealt with reading during the past few decades, but only a few of them have investigated music reading, and no global theories have been invented. The method and texts used are important to the reading motivation of the students. Students can be motivated to read more by encouraging them to act out the reading experience (Józsa–Steklács, 2012). Art education should involve visiting art institutions (theatres, concert halls, museums and exhibitions) and also the discussion of the experiences. Csíkszentmihályi found an important relationship between full involvement in the activity and the learning process. Music can cause a flow experience, which can happen if someone is able to listen to the music in an analytical way. The flow is greater in those who can play the music themselves (Janurik–Pethő, 2009).

The term 'functional music literacy' is defined by Jorgensen (1981) as the minimal level of musical skills which enables students to function with musical materials. Functional reading literacy is generally seen as an enculturation process where literacy practices at school are designed so that they resemble literacy events, practices, and authentic texts used for specific purposes in real-life contexts, emphasizing social interaction and collaborative construction of meaning (Linnakyla, 2007). The principal aim of music education is to develop functional musical literacy through solo or group (choir, chamber or orchestra) performances.

With eye tracking analysis music reading, including fixations, saccades, pupil deletions and blinks can be observed. Eye tracking technology has developed rapidly in the past few years. Researchers are examining the nature and development of information processes in several fields such as reading, mathematics, music, art, language, sciences, Information Technology and even in market research. It is suggested that the individual's musical skills significantly influence the eye movements during music reading. It was Louis Émile Javal, an ophthalmologist from Paris, who first drew attention to the behaviour of the eyes during reading at the end of the 19th century. Javal observed the eye movements of primary school students during the reading process and found that the eyes do not move continuously, but skip from one point to the other in the text. (Steklács, 2013). Musical structures are important in reading materials to enhance and facilitate students reading skills.

possibilities in the field of technology-based transfer research. Computer-based data collection enhances the objectivity and validity of the measurement and evaluation (Csapó–Csépe, 2012).

We conducted our research in primary and specialised music schools. Our musical tests were developed to measure the disciplinary dimension of music reading and we also placed an emphasis on Kodály's music reading exercises. Our test designed for music school students contained 55 closed items. For mainstream school students a similar assessment form containing 35 items. Our online test contained an appendix of three map reading tasks exploring students' spatial abilities, because it was hypothesised that visual/spatial orientation is related to music reading skills. To my knowledge, in the international literature there are only music tests that measure mainly aural skills, and no complex measurement for music reading skills has been used in Hungary.

The findings of this research can provide information for the educational system about how familiar Hungarian students are with the components of music reading. They can further support the teaching of music reading and reading strategies as a curricular objective and the development of detailed curricula. The validity of the tests are confirmed by the better results of the music school students.

If the achievements of the two different types of schools are compared, it can be observed that the achievement of the music school students was higher, at 76.69 per cent, while that of mainstream school students was only 55.23 per cent. This is not at all surprising, as there is more emphasis on teaching music reading in music schools. The reading achievement of the upper school pupils significantly correlated with achievement in the visual/spatial test ($p < 0.001$). Music school students achieved significantly better results on each task of the map-reading subtest than primary school students. In the background questionnaire the cognitive background variables were represented by the school grades. Most of the correlations were found between the performances in the music reading tests on the one hand and Hungarian literature, grammar, English, biology, music and with behaviour and diligence on the other. The music reading achievement has a connection with the use of metacognitive strategies and also with some components of functional music literacy, such as performing as a soloist, or in a choir.

Extending the online music reading testing across different cities in different countries can increase the generalisability of the results. The online platform makes it possible to bridge distances. The test also has a version in German which was used to test the music reading skills of primary school students in Luxembourg on the online platform.

These tests could be a helpful guide for future music instruction and they can serve as an objective component of the students' evaluation. They also help the students and the music educators to understand the value of achievement in music reading, both as a part of their grades and as a part of their developing musicianship.

SUMMARY

“Real art is one of the most powerful forces in the rise of mankind, and he who renders it accessible to as many people as possible is a benefactor of humanity”
(Zoltán Kodály)

Zoltán Kodály composed reading and singing exercises for practicing from primary to professional levels. He claimed that music reading and writing (like the alphabet) can be learnt by anyone. Kodály wrote numerous articles and essays on his educational concept and gave many speeches at international conferences. He stressed that the goal is not only to teach music, but also to improve teaching techniques (Király, 2012). In all his pedagogical writings Kodály emphasised that music should have a central role in education. Although the application of Kodály’s ideas on music education in Hungary is rooted in Hungarian folk music, his concept is easily adaptable to the folk music of any other nation. Improving students’ music reading is one of the central parts of general and specialised music education and it is able to influence life-long involvement in active music making, and can also heighten the enjoyment of listening to music and add value to students’ lives.

REFERENCES

- Altenmüller, Eckhart – Gruhn, Wilfried (2002): Brain Mechanism. In: *The Science and Psychology of Music Performance*. Eds. Richard Parncutt, Gary McPherson, Oxford University Press, New York, 63–82, doi: 10.1093/acprof:oso/9780195138108.001.0001.
- Barkóczi, Ilona – Pléh, Csaba (1982): *Music Makes a Difference*. Petőfi Nyomda, Kecskemét, 18–21.
- Bever, Thomas G. – Chiarello, Robert J. (1974): Cerebral Dominance in Musicians and Non-Musicians. *Science*, vol. 185, 537–539, doi: 10.1126/science.185.4150.537.
- Cole, Hugo (1974): *Sounds and Signs: Aspects of Musical Notation*. Oxford University Press, Oxford.
- Cross, Ian (1999): Is Music the Most Important Thing We Ever Did? Music, Development and Evolution. In: *Music, Mind and Science*. Ed. Suk Won Yi, Seoul National University Press, Seoul, 10–39.
- Csapó, Benő – Csépe, Valéria (2012): Bevezetés [Introduction]. In: *Tartalmi keretek az olvasás diagnosztikus értékeléséhez* [Framework for Diagnostic Assessment of Reading]. Eds. Benő Csapó, Valéria Csépe, Nemzeti Tankönyvkiadó, Budapest, 9–16.
- Darwin, Charles (1871): *The Descent of Man and Selection in Relation to Sex*. Murray, London.
- Flohr, John – Hodges, Don (2002): Music and Neuroscience. In: *The New Handbook of Research on Music Teaching and Learning: A Project of the Music Educators National Conference*. Eds. Richard Cowell, Carol Richardson, Oxford University Press, Oxford, 991–1008, doi: 10.1093/acprof:oso/9780195304565.001.0001.
- Gerry, David – Unrau, Andrea – Trainor, Laurel J. (2012): Active Music Classes in Infancy Enhance Musical, Communicative and Social Development. *Developmental Science*, vol. 15, no. 3, 398–407, doi: 10.1111/j.1467-7687.2012.01142.x.
- Gönczy, László (2009): Kodály-koncepció: A megértés és alkalmazás nehézségei Magyarországon [Kodály Concept: The Difficulties of Understanding and Application in Hungary]. *Magyar Pedagógia*, no. 2, 169–185.
- Hagen, Edward H. – Bryant, Gregory (2003): Music and Dance as a Coalition Signaling System. *Human Nature*, vol. 14, no. 1, 21–51.
- Hallam, Susan (2010): The Power of Music: its Impact on the Intellectual, Social and Personal Development of Children and Young People. *International Journal of Music Education*, vol. 28, no. 3, 269–289.

- Király, Zsuzsanna (2012): *Computer-aided Eartraining*. Révai Digitális Kiadó.
- Kokas, Klára (1972): *Képességfejlesztés zenei neveléssel* [Skills Improvement Through Musical Education]. Zeneműkiadó, Budapest.
- Janurik, Márta (2008): A zenei képességek szerepe az olvasás elsajátításában [Role of Musical Skills in Learning to Read]. *Magyar Pedagógia*, vol. 108, no. 4, 289–318.
- Janurik, Márta – Pethő, Villő (2009): Flow-élmény az énekórán: a többségi és a Waldorf iskolák összehasonlító elemzése [Flow Experience During Music Classes: A Comparative Analysis of Majority and Waldorf Schools]. *Magyar Pedagógia*, vol. 109, no. 3, 193–226.
- Jorgensen, Estelle (1981): School Music Performance Programmes and the Development of “Functional Musical Literacy”: A Theoretical Model. *College Music Symposium*, 21, 82–93.
- Józsa, Krisztián – Steklács, János (2012): Content and Curriculum Aspects of Teaching and Assessment of Reading. In: *Framework for diagnostic assessment of reading*. Eds. Benő Csapó, Valéria Csépe, Nemzeti Tankönyvkiadó, Budapest, 129–182.
- Linnakyla, Pirjo (2007): Finnish Reading Literacy Challenged by Cultural Change. In: *Finnish Reading Literacy. When Quality and Equity Meet*. Eds. Pirjo Linnakylä, Inga Arffman, Finnish Institute of Educational Research, University of Jyväskylä.
- Morley, Ian (2002): Evolution of the Physiological and Neurological Capacities for Music. *Cambridge Archaeological Journal*, vol. 12, no. 2, 195–216, <https://doi.org/10.1017/s0959774302000100>.
- Rayner, Keith – Pollatsek, Alexander (1989): *The Psychology of Reading*. Prentice-Hall, New York, (cit. Csapó–Csépe, 2012).
- Schlaug, Gottfried et al. (1995): Increased Corpus Callosum Size in Musicians. *Neuropsychologia*, vol. 33, no. 8, 1047–1055, [https://doi.org/10.1016/0028-3932\(95\)00045-5](https://doi.org/10.1016/0028-3932(95)00045-5).
- Schmithorst, Vincent J. – Holland, Scott K. (2004). The Effect of Musical Training on the Neural Correlates of Math Processing: a Functional Magnetic Resonance Imaging Study in Humans. *Neuroscience Letters*, no. 3, 193–196, <http://dx.doi.org/10.1016/j.neulet.2003.10.037>.
- Steklács, János (2013): *Olvasási stratégiák tanítása, tanulása és az olvasásra vonatkozó meggyőződés* [Teaching and Learning Reading Strategies and the Conviction Regarding Reading]. Nemzedékek Tudása Tankönyvkiadó, Budapest.
- Ulbaek, I. (1998): The Origin of Language and Cognition. In: *Approaches to the Evolution of Language: Social and Cognitive Bases*. Eds. James R. Hurford et al., Cambridge University Press, Cambridge.