

Computer-aided Ear-training

A Contemporary Approach to Kodály's Music Educational Philosophy

Susanna Király

COMPUTER-AIDED EAR-TRAINING

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Susanna Király

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Abstract

My doctoral thesis has involved two related tasks. The first was to analyse Zoltán Kodály's philosophy of music education and, on this basis, to develop a computer-assisted instructional method (CAI) for teaching music theory and solfège (ear-training). The second task was to experiment with the effectiveness of this method and compare it with traditional approaches to teaching. Many students find music theory and ear training difficult. During the 1990s, in connection with my licentiate thesis "Solfège in the Computer Classroom" (2000), I initiated this research project and, developed a CAI method for teaching music theory and solfège. I wanted to see just how useful Kodály's approach could be in computer-aided teaching and learning.

Kodály's philosophy of music education includes the idea that every child has the right to learn his musical mother tongue. This learning should take place in a child-centred, natural and easy way. In the present study, I particularly focused on the opportunities for developing and testing the new, computer-aided teaching method, especially for ear-training, using Kodály's concept. My purpose was to create a learning tool that could be used in music schools to facilitate the teaching of music theory and solfège.

The second objective of my study was to examine the effectiveness of this new tool. Did these newly-developed CAI materials and methods cause differences in students' learning outcomes in different environments? Three different groups tested the music theory and solfège instruction with CAI: the PIT group, in which there was a computer-aided tutorial, but only the teacher used a computer, not the students; the FIT group, in which each student had a computer, and each could interact with the curriculum independently; and a control group, TRAD, to whom music theory and solfège were taught using a traditional method, that is, without any computer-aided programme. The study was conducted in the West Regional Music Institute (LUMO) in Lohja, Finland, during the school year 2004–05. The study included a total of 125 music students, ages 10 to 16.

This is an empirical and pedagogical developmental study. The testing phase also included quantitative analyses. The paramount objective was to develop and test a Kodály-based CAI solfège pedagogy. The results show that the Kodály approach can be successfully applied to the development of a computer-aided solfège programme: the Kodály-based computer-aided music theory and solfège material in fact produced the best results in most areas of learning, especially in the PIT group, in which a teacher worked with a computer-aided tutorial. The results also show that the Kodály system is applicable to new learning environments and teaching practices. It suggests that the computer-aided tutorial works well to support music theory and ear-training in individual lessons and indicates that pupils are eager to learn by using the computer. In music education CAI is an area with great potential for development. It offers multiple learning options and can enhance students' motivation to study music theory and ear-training; some of the learning outcomes were even better than with the traditional ways of learning. The results also show, however, that the teacher–pupil interaction is essential in a computer-aided learning programme.

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Keywords: basic education in the arts, CAI, digital network equipment, ear-training, Kodály, music education, music education technology, music theory, solfège

... ..

Susanna Király:

Tietokoneavusteinen säveltapailu
Uusi lähestymistapa Kodály'n musiikkikasvatusfilosofiaan

... ..

Tiivistelmä

Väitöstutkimukseni sisältää kaksi toisiinsa liittyvää osaa. Ensimmäisenä tutkimustehtävänä on ollut perehtyä Kodály'n ajatuksiin ja periaatteisiin musiikkikasvatuksesta sekä kehittää tietokoneavusteinen ohjelma Kodály-filosofian periaatteisiin pohjautuvan säveltapailun opettamista varten. Toisena tutkimustehtävänä on ollut kokeilla tietokoneavusteisen opetusmenetelmän toimivuutta ja verrata sitä perinteiseen opetusmenetelmään. Monet oppilaat kokevat musiikin teorian ja säveltapailun oppimisen vaikeiksi. 1990-luvulla tekemässäni liseniaatin tutkimuksessa ”Solfège in the computer classroom”(2000) aloitin perehtymisen tutkimusaiheeseen ja tietokoneavusteisen opetusmenetelmän kehittämiseen.

Väitöstutkimukseni ensimmäisenä tutkimusongelmana oli selvittää kuinka Kodály'n periaatteita voidaan käyttää tietokoneavusteisen säveltapailun opetusohjelman kehittämisessä ja toisaalta millainen on Kodály'n periaatteiden käyttökelpoisuus tietokoneavusteisessa oppimisessä. Kodály'n musiikkikasvatusfilosofian keskeisiin periaatteisiin kuului ajatus siitä, että jokaisella lapsella tulisi olla oikeus ja mahdollisuus musiikin kielen oppimiseen ja tämän oppimisen tulisi tapahtua lapselle luonnollisella ja helpolla tavalla. Tutkimuksessani olen syventynyt Kodály-konseptin mahdollisuuksiin erityisesti säveltapailun tietokoneavusteisen opetusmenetelmäni kehittämisessä ja sen toimivuuden testaamisessa. Nyt kehitetyn opetusohjelman tarkoituksena on ollut luoda uusi Kodály-pohjainen, säveltapailun oppimista helpottava väline musiikkioppilaitosten käyttöön.

Väitöstutkimuksen toisena tavoitteena on ollut tutkia nyt kehitetyn tietokoneavusteisen Kodály-ajatuksiin pohjautuvan opetusmenetelmän toimivuutta musiikin teorian ja säveltapailun perustason oppimisprosessissa. Tutkimusongelmana oli selvittää, onko nyt kehitetyllä tietokoneavusteisella opetusmateriaalilla ja menetelmällä eroavuuksia oppilaiden säveltapailun oppimistuloksiin erilaisissa oppimisympäristöissä. Säveltapailun opiskelua tapahtui kolmessa erilaisessa ryhmässä. Ensinnäkin PIT-ryhmässä, jossa tietokoneavusteinen opetusohjelma oli opettajan kautta ja ohjaamana luokan oppilaiden käytössä, kun taas TIT-ryhmässä jokaisella oppilaalla oli oma tietokone ja he käyttivät säveltapailun opetusohjelmaa itsenäisesti. Vertailussa oli mukana myös TRAD-ryhmä, jossa säveltapailua opetettiin perinteisellä menetelmällä ilman tietokoneavusteista ohjelmaa. Tutkimus on tehty Länsi-Uudenmaan musiikkiopistossa (Lumo) vuosina 2004–2005. Tutkimuksessa oli mukana yhteensä 125, 10–16-vuotiasta, musiikkiopiston oppilasta. Tutkimus on luonteeltaan kehittävä ja empiirinen, opetusmenetelmän testausvaiheessa myös kvantitatiivisia analyyseja sisältävä. Keskeisimpänä tutkimustavoitteena on ollut Kodály'n musiikkikasvatuksen periaatteisiin pohjautuvan säveltapailun pedagogiikan kehittäminen uutta tietokoneteknologiaa hyödyntäen sekä tämän tietokoneavusteisen pedagogiikan toiminnan testaaminen.

Tutkimustulokset osoittavat, että Kodály'n periaatteita voidaan soveltaa tietokoneavusteisen säveltapailuohjelman kehittämisessä. Tutkimustulosten mukaan nyt kehitetty Kodály-pohjainen tietokoneavusteinen säveltapailun opetusohjelma antaa parhaimmat oppimistulokset PIT-

ryhmässä, jossa opettaja ja tietokoneavusteinen opetusohjelma toimivat yhdessä säveltapailun oppimisen edistäjinä. Tutkimustulokset osoittavat, että Kodály'n musiikkikasvatuksen periaatteet ovat sovellettavissa uusiin oppimisympäristöihin ja opetusmuotoihin. Tulosten mukaan tietokoneavusteinen opetusohjelma toimii hyvin opettajan tukena säveltapailun oppitunneilla ja oppilaat ovat innokkaita oppimaan tietokoneen avulla. Musiikin opetuksessa tietokoneavusteisten opetusmenetelmien kehittäminen on uusi ja kehittyvä alue. Se tarjoaa uusia oppimisen tapoja erilaisille oppijoille ja voi parantaa motivaatiota opiskella musiikin teoriaa ja säveltapailua. Osalla oppilaista oppimistulokset voivat olla jopa paremmat kuin perinteisellä tavalla opiskeltaessa. Tulokset osoittavat kuitenkin sen, että opettaja-oppilas – vuorovaikutussuhde on keskeinen myös tietokoneavusteista opetusohjelmaa käytettäessä.

... ..

Avainsanat: digitaaliset verkko-materiaalit, Kodály, musiikin teoria, musiikkikasvatus, musiikkikasvatusteknologia, säveltapailu, taiteen perusopetus

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ABBREVIATIONS AND ACRONYMS

CHAPTER 1

CAI	Computer-aided Instruction
LUMO	West Regional Music Institute in Lohja, Finland

CHAPTER 2

AV	Audio-visual
E-book	electronic (digital) book
IKS	International Kodály Society
EMF	Elementary Mental Functions
MI	Multiple Intelligences
MKO	the More Knowledgeable Other
PDA	Personal Digital Assistant
ZPD	Zone of Proximal Development

CHAPTER 3

FKC	Finnish Kodály Center	Suomen Kodály-keskus
FKS	Finnish Kodály Society	Suomen Kodály-seura
IKS	International Kodály Society	Nemzetközi Kodály Társaság

CHAPTER 4

ATMI	the Association for Technology in Music Instruction
EFTA	the European Free Trade Association
EU	European Union
Eurydice	Information on Education Systems and Policies in Europe
FME	the Finnish Ministry of Education
ICT	Information and Communication Technology
ISME	International Society for Music Education
IT	Information technology
MOVE	Music Education and Research Online
OPM	the Ministry of Education
PLATO	Programmed Logic for Automated Teaching Operations
PISA	the Programme for International Student Assessment
RIME	Research in Music Education
PLATO	Programmed Logic for Automated Teaching Operations
PISA	the Programme for International Student Assessment
RIME	Research in Music Education
TV	Television [telecommunication medium]
UNESCO	United Nations Educational, Scientific and Cultural Organization

ABBREVIATIONS AND ACRONYMS

CHAPTER 5

FIT	Full Information Technology	personal instruction, computer for everyone
PIT	Part Information Technology	group teaching, computer used by the teacher
TRAD	Traditional Teaching	without computer

CHAPTER 6

CD	Compact Disc
DOM	Functional syllable for the dominant
EACEA	The Education, Audiovisual and Culture Executive Agency
FNBE	Finnish National Board of Education
MIDI	Musical Instrument Digital Interface
SUB	Functional syllable for the subdominant
TON	Functional syllable for the tonic
VCR	Video Cassette Recorder

CHAPTER 7

UCLA	University of California, Los Angeles
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Data Codes / Inserts Nos 15–17

V1_1	Pre-octaves	music theory task
V1_2	Post-octaves	music theory task
V2_1	Pre-barlines	music theory task
V2_2	Post-barlines	music theory task
V3_1	Pre-scales	music theory task
V3_2	Post-scales	music theory task
V4_1	Pre-intervals	music theory task
V4_2	Post-intervals	music theory task
V5_1	Pre-musical terms	music theory task
V5_2	Post-musical terms	music theory task
V6_1	Pre-melodic dictation	solfège task
V6_2	Post-melodic dictation	solfège task
V7_1	Pre-rhythmic dictation	solfège task
V7_2	Post-rhythmic dictation	solfège task
V8_1	Pre-chordic dictation	solfège task
V8_2	Post-chordic dictation	solfège task
V9_1	Pre-chords	music theory task
V9_2	Post-chords	music theory task
V10_1	Pre-interval dictation	solfège task
V10_2	Post-interval dictation	solfège task
V11_1	Pre-cadence dictation	solfège task
V11_2	Post-cadence dictation	solfège task

My doctoral thesis has involved two related tasks. The first was to analyse Zoltán Kodály's philosophy of music education and, on this basis, to develop a computer-assisted instruction method (CAI) for teaching music theory and solfège (ear-training). The second task was to experiment with the effectiveness of this method and compare it with traditional approaches to teaching. Many students find music theory and ear training difficult. During the 1990s, in connection with my licentiate thesis "Solfège in the Computer Classroom" (2000), I initiated this research project, and developed a CAI method for teaching music theory and solfège. I wanted to see just how useful Kodály's approach could be in computer-aided teaching and learning.

The results show that the Kodály approach can be successfully applied to the development of a computer-aided solfège programme and the Kodály system is applicable to new learning environments and teaching practices. In music education CAI is an area with great potential for development. It offers multiple learning options and can enhance students' motivation to study music theory and ear-training; some of the learning outcomes were even better than with the traditional ways of learning. The results also show, however, that the teacher-pupil interaction is essential in a computer-aided learning programme.



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