

Increasing Access to Sound-based Music – www.eEMS

Leigh Landy

Music, Technology and Innovation Research Centre
De Montfort University (Leicester UK)
llandy@dmu.ac.uk www.mti.dmu.ac.uk/~llandy

Abstract:

This paper introduces the ongoing ElectroAcoustic Resource Site Pedagogical Project, or EARS II, in some detail. EARS II is to become an online educational resource for two groups of users: children of ca. 11-14 years of age as well as people of all ages who have little to no knowledge of electroacoustic music and undergraduate students embarking upon a study of electroacoustic music. EARS II is based on a holistic approach linking appreciation to understanding and creative application. The paper's goal is to share the project vision and provide an update concerning how far the project team has come. The project is the second phase of the original EARS site (www.ears.dmu.ac.uk) as well as the second phase of the Music, Technology and Innovation Research Centre's Intention/Reception project.

1. Introduction

It is sometimes awkward to present a paper that discusses an unfinished project. I have often been disappointed by talks/articles starting with the word 'Towards', but have made an exception in this case as the project at the focus of this talk is one that will be needing input and suggestions during all of its phases from interested parties within the EMS community. Therefore the listener (reader) is asked for indulgence as this tale concerns a project's vision, not its outcome.

The subject matter is well aligned to the two EMS09 themes: heritage and the future. In this case, heritage has to do with the creation of a cultural heritage through education (as opposed to applying cultural heritage to electroacoustic music); the link to the future is an obvious one as it is interwoven with my own 'evergreen', discussing the accessibility of innovative electroacoustic repertoire. Increasing access is talking about future scenarios, in this case one that would enrich electroacoustic music's heritage whilst ensuring its healthy future.

Since the early part of this decade, the Music, Technology and Innovation Research Centre (MTI) has been involved with the ElectroAcoustic Resource Site or EARS (www.ears.dmu.ac.uk). This will be introduced in the briefest terms below as it is assumed that most members of the EMS community will already be familiar with it. The site continues to flourish, in particular in terms of the number of languages it contains as well as its publishing arm which was recently embellished with the first English language translation of Michel Chion's *Guide des objets sonores* by John Dack and Christine North.

For reasons detailed below, it was discovered that EARS (EARS I in current terminology) has succeeded in terms of its usefulness to people already committed to electroacoustic music, but that it is perhaps too sophisticated or missing certain types of information for people with less experience who would like to learn more about the field of electroacoustic music studies (thus the talk's subtitle, www.eEMS). What will be discussed for most of the remainder of this paper, after a section on the two research projects that led to this pedagogical initiative, is the rationale behind our perception of a need for EARS II, the ElectroAcoustic Resource Site Pedagogical Project and its vision, that is, how we are planning on developing it. As suggested above, feedback is welcome; thus, the paper might be seen as a request for further ideas as we are still in a reasonably flexible phase of development.

2. EARS II's predecessors: EARS I and the Intention/Reception project

EARS was constructed for several reasons: to help delineate the field of electroacoustic music studies through its index; to identify issues related to terminology and, ideally, help to resolve them through its glossary; and to offer searchable information concerning paper-based and other forms of publications related to the field through its bibliography. Subsequent to its original appearance, further languages were added and continue to be so (German is nearing completion, Greek, Portuguese and Mandarin are in development) thus leading to its Thesaurus; and EARS I has the above-mentioned section in which relevant publications are on offer. User statistics demonstrate a consistent, if not slowly increasing international interest in the site's contents. The completion of the main construction of EARS I was presented at EMS07.

Concurrent with the development of EARS, the Intention/Reception project was born. This project was presented at EMS05. Related publications to both can be found at the end of the text. This research project originally consisted of two goals: 1) to see to what extent electroacoustic composers' intentions were being received by listeners of various experience levels; and 2) to discover how accessible certain forms of electroacoustic music might be to groups of inexperienced listeners. The project's two key discoveries were: 1) although the intention/reception loop works differently in different works, people with less listening experience in general favour works in which there is a clear intention involved and where they are able to discover what the dramaturgy of the works are; 2) access for the chosen works in inexperienced groups ranged from just under 60% to just under 80%. The selection of pieces included thus far spans from soundscape works to works in which sounds are highly manipulated but where there is some sense of source recognition possible.

The Intention/Reception project has expanded as students and researchers have taken on the methodology and applied it to their own goals, at the MTI, around the UK, but also as far afield as in New Zealand and Malaysia. It is now being used with other repertoires. The reason for discussing it here is that it has provided a wonderful basis for part of the EARS II pedagogy, primarily for the development of music appreciation, but this methodology is also a means of connecting appreciation with understanding.

When UNESCO, the cultural arm of the United Nations, decided to support the EARS initiative, linking it to its own DigiArts project, one of their staff asked whether we had plans to produce a reduced list of the glossary for beginners using a non-technical language. It was clear that there was a need for this. However, whilst planning this second version of the EARS site, it became perfectly obvious that a glossary and associated beginner's bibliography would not be satisfactory. A more complete pedagogical system was needed that went much further, as nothing comparable was available. Ironically whilst investigating what would be needed, it was also discovered that the same approach would also be useful for university-level students as there was also no comparable system for this group currently, although some attempts have been made to deal with at least aspects of electroacoustic music studies by way of eLearning as will be noted shortly.

3. EARS II: background

Clearly EARS is serving a purpose if so many people use it on a daily basis. This makes all of the work that the EARS team has invested worthwhile. The Intention/Reception project with its remarkably high access statistics serves as a wonderful lobbying tool to demonstrate that electroacoustic music deserves more attention, in particular in terms of gaining its rightful place in education for the young and furthermore in terms of it being provided with more attention by the media. (The Internet will assist in both cases inevitably.) The Intention/Reception project also has been demonstrated to offer a malleable methodology, useful to a number of people working on our field.

In constructing the EARS site, it became increasingly clear that there seems to be no basic or common approach to the teaching of this corpus of music. More remarkable was the fact that EARS clearly demonstrated inconsistent usage of terminology leading me to drop the term electroacoustic music from my own teaching (although the world is not quite ready for it to be dropped from the EARS acronym) and replace it with the term, *sound-based music* which I have demonstrated has its own paradigm and thus deserves its own approach to learning. This term will be used from now on.

Still, wishing for sound-based music to gain its rightful place in pre-tertiary education might be seen to be extremely idealist by members of the EMS community who share an interest in those levels of education. Some countries including the UK have reduced their focus on music tuition in recent years; thus requesting (more) time for sound-based music may come across as a ridiculous idea. It is our view that learning about sound-based music can prove relevant and exciting for a large group of young people internationally opening up some opportunities that traditional music teaching cannot provide; for example, there is no reliance on notation. Our focus, based on the UNESCO query, is the age group of children ranging from 11 to 14 or 'key stage 3' in the UK. Our premise is that by educating children of this age group, there would be an enormous impact on appreciation as well as participation of sound-based music and, furthermore, students' more general skills, such as communication skills, ability to deal with symbolic information and so on, would increase accordingly. What we have subsequently discovered is that most of what is planned for this age group might equally be of use to people of all ages who have little to no knowledge of this musical corpus and may act as a steppingstone to the second focus group for EARS II, undergraduates embarking on a study of sound-based music as well as other interested parties with some knowledge of the area.

Clearly we have done a survey of systems in the field and also have looked at generic online learning systems. We found Barry Truax's online "Handbook of Acoustic Ecology" and Mark Ballora's online module in the history of electroacoustic music at Penn State University both to provide elements of good practice within their very different and more limited briefs. A survey of eLearning environments for creative subjects was pursued leading to a greater overview of initiatives and related tools. Again, examples of good practice will inform our project, but it became clear that what is needed must be largely bespoke given the specific multimedia needs related to sound-based music studies.

4. EARS II: its vision

The point of departure for the EARS pedagogical project (EARS II) is an integrated, that is, holistic 3-way approach combining music appreciation, the understanding of concepts related to the studies of this body of music and its creative application. The Groupe de Recherches Musicales' 2000 CD-rom entitled "La musique électroacoustique" has influenced our approach and, in fact, we have been working closely with colleagues at the GRM from the outset as they have already advised the creation of the prototype for the creativity software for the project called Sound Organiser. EARS II is intended, like the original EARS site, to be multi-lingual; it will also be culturally adaptable taking regional understandings into account and using repertoire from different areas where relevant. What now follows is an overview of what we intend to achieve with this system whilst identifying many of its key innovative aspects.

i) *The delineation of the field of electroacoustic music studies* The EARS I delineation of the field is invaluable in terms of selecting items of relevance and routes related to learning. Although this framework is informing EARS II, this pedagogical system will allow for various forms of navigation (see below) meaning that the user need not follow any prescribed routes of navigation. For those unacquainted with the EARS site, a quick wander through its index by way of its six main headers is recommended.

ii) *How to combine learning with appreciation as well as enjoyment* One of the great inspirations for the entire project and the creative environment in particular is computer games. That may seem a bit opportunistic or trendy, but in fact the idea of being challenged and being offered the ability to discover (learn) more by climbing to higher levels represents an approach to education where enjoyment is as important as work. Therefore the concept of levels is integrated into the EARS II approach and the satisfaction of climbing to a subsequent level is combined with the ability to learn and experience more. It is worthy to mention that there is a good deal of sound-based music in many computer games besides the more algorithmic atmospheric note-based music one hears. So this, too, has inspired the approach to the project

iii) *Differences of pedagogical approach related to users with varying levels of experience* EARS II will be able to take into account the learner's previous experience, allowing for entry at more than one starting point and using a vocabulary that is appropriate for the level of experience and age group. PhD researcher Motje Wolf is currently trying out content and web page design on children in the 11-14 age group, simulating the system using a Wiki blog thus allowing for live and online feedback to establish what works and what is problematic with young users. Examples of test pages are included towards the end of this paper. Even within the planned children's system, information will be provided at different levels, thus acting as a steppingstone between the children's EARS II and the undergraduates' area, the latter of which maps directly onto the current EARS I level of discourse.

iv) *Concept- (not history-) driven* A key principle behind the pedagogy of EARS II is the fact that it is to be concept-driven as opposed to the more traditional historical approach. This does not mean that there will be no diachronic information offered. That would be like a polemical reaction. The point here is that, particularly with younger students, telling the story of sound-based creativity is not necessarily best understood by way of its history. An example: many children will be aware of Hip Hop; many, too, will know what a sample is, but few will have ever heard the words *musique concrète* and certainly not *acousmatic*. Even the word *electroacoustic* will probably be new. Therefore, any music using sounds from the real world, recorded and eventually manipulated, will be presented by way of this concept real-world sounds. Synthesised sounds, even those which are intended to sound like real-world sounds, are introduced within another concept. Thus *musique concrète* is primarily linked to the former concept and *elektronische Musik* the latter. As little in this world is black and white, any hybrid or cross-category items will be treated as such. The basic idea behind this concept-based approach is that it will be dynamic; therefore the presentation of how things fit together will be influenced by users' views of how terms relate to one another semantically.

v) *Variable navigation within the eLearning environment* One of the most exciting things about eLearning is its ability to be navigated in a manner that is quite different to book-based learning. One can jump around when one is interested in a particular subject and then continue with the basic learning curve of the day. EARS II will have various pre-set paths of navigation that will be led by a virtual tutor. It will also offer teachers the opportunity to create their own pathways for their students and be able to view their results, including diagnostics (see below) to enable them to help students alongside the online help aids the system will possess. Individuals may choose to create their own pathways or simply hunt about as they use the system. In short, all options are present, thus taking advantage of the openness eLearning offers.

vi) *How to collect and report upon diagnostic information concerning sound manipulation tasks* One of the biggest challenges being faced currently is the ability to follow a user's approach to certain challenges. It is one thing to see how one reacts to a multiple choice or factual question; it is quite another thing to follow how one takes on the challenge of understanding and manipulating the settings of a comb filter. The system will enable users to do real-time sound manipulation on learning web pages as well as within the Sound Organiser creative environment. If a student encounters difficulties with a task, it is imperative that the system is able to understand what is going wrong by way of artificial intelligence algorithms and offer some tips as to how to achieve better results without frustrating the user. Clearly our collaboration with specialists in software engineering is essential for the project to succeed. PhD student Yingchun (Tina) Tian is working with her supervisor, Hongji Yang at De Montfort's Software Technology Research Laboratory to investigate efficient means of diagnostic support. They are also responsible for the general architecture of the site (see below).

vii) *Integrating repertoire* Beyond the obvious issues related to authors' rights – and many approached thus far seem to be pleased to have their or their organisation's works included in the EARS II system – the development of music appreciation is not intended to be treated in isolation. For example, being sent to this part of the system may have to do with a technique related to sound manipulation; it may obviously also have to do with an introduction to a genre or a musician. Once such examples have been accessed, associated examples, perhaps exemplifying greater complexity or an associated issue, are recommended. Rob Weale, who has been closely associated with the Intention/Reception project from the start, is leading this element of EARS II.

viii) *The creative environment, Sound Organiser* A prototype for the Sound Organiser was created in 2007 by John Anderson. Originally envisioned as a stand-alone offline program with an online 'highest level' for real-time sound-based jamming, the Sound Organiser has been found to be the ideal environment for creative work on EARS II. Its design also informs any sound-based examples elsewhere in the EARS II environment. The background to this software was to create something that involved little to no previous knowledge, used clear visual information for identifying sounds and the manipulations related to sounds as well as the manipulated sounds within a multi-channel sequence. Sound Organiser might be seen to be a steppingstone to more sophisticated, often expensive, audio environments such as ProTools and Logic. For example, a Sound Organiser 'sound card' becomes lighter if the volume is reduced, moves

left or right based on stereo panning, and can be seen in multiple copies if delay is applied. This type of easy and obvious mapping makes this program extremely user friendly and is ideal in particular for the children's version of the site, but also for practical examples for undergraduates. It is assumed the latter group will use higher-level software during or shortly after an EARS II introduction.

ix) *The Content Management System (CMS)* John Anderson has also developed a content management system (or knowledge repository). This is in constant use by people who have started to input content into EARS II. What is wonderful about this system is the ability to construct pages extremely quickly and easily involving any combination of text, hyperlinks, still image, audio, video, flash, or even applet for real-time audio manipulation using the Sound Organiser. Examples follow below.

x) *Proposed tagging systems and other forms of user-generated content* In a period where Web 2.0 or semantic web are the calling of the day, it is not simply opportune to investigate how users feel about how concepts in EARS relate to one another. Please note that EARS I was launched based on the premise of a terminology crisis which is alive and well in 2009. EARS I used a tree structure to introduce terms at levels relating to one another, but new ontologies are more flexible. The development of such ontologies (whether related to concepts or to sounds, themselves) will help users determine their own EARS II navigation. The system will offer a blog and other forms of user input, be it communication systems that allow for some editorial control as is the case with EARS I. In this manner, EARS II can remain dynamic allowing for user input in all aspects of its content.

xi) *Model-Driven Architecture (MDA)* The above-mentioned colleagues from the university's Technology Faculty have chosen to use an MDA approach to the construction of EARS II using the IEEE's Learning Technology Systems Architecture (LTSA) standard. This subject takes us into the more technical side of the project, perhaps a subject of less interest to most EMS participants. A reference is provided below for a description of this part of the project.

xii) *Rich Internet Application (RIA) via Sound Organiser* The above-mentioned Sound Organiser will not only serve as the basis of the creativity side of EARS II, it will be developed into a Rich Internet Application meaning that different levels of usage can be supported by way of the RIA. There will be a difference between any individual's using EARS II to an educational organisation which has a more formal agreement with the MTI, thus having access to greater support. (It has to be admitted at this point, that any potential commercial development of EARS II has been postponed until the entire complexity of the system is known. Obviously organisations such as UNESCO would like us to achieve open access, which is our goal as well.) The difference between the use of an RIA and an online-only system has to do with speed. A great deal of the data can be downloaded through the application aiding high-speed audio and audio-visual streams regardless of Internet connection.

xiii) *Cultural adaptability* As with EARS, the pedagogical system will offer flexibility to allow for cultural adaptability. For example, some explanations may need to be changed due to local terminology usage or sound examples chosen to include either identifiable sounds or regional musicians' examples. In this way, local values in EARS II are to be incorporated; not all repertoire needs to be determined by people far away.

xiv) *How to relate this approach to other forms of music* Although for the purposes of EMS09 the key interest is the creation of EARS II, that is, a dynamic and exciting pedagogical system in our field. Still, it is hoped that much of the developed architecture will be found to be of use to people in other areas of music, in other arts fields and beyond.

The EARS II team is looking for two types of partners to help develop the project. The first, more modest type consists of individuals, organisations or groups who would like to assist in supporting cultural adaptation and translation of the site once it is found to be working well and robust. The second type consists of collaborators, such as the GRM in Paris, who will actively participate in the creation of part of the content of the site and/or advising on some of its constituent elements. Potential partners include the ZKM and Universität der Künste Berlin in German, the EPHMEE group at the Ionian University in Greece and the Chinese Electroacoustic Music Center in China. Others are also welcome to join this initiative.

5. EARS II: Examples

This section presents still images demonstrating the look of EARS II (as well as the home page of the original EARS site). It contains examples related to Motje Wolf's early experiments with children, some early music appreciation experiments led by Rob Weale, examples of the Content Management System and some images of the Sound Organiser.

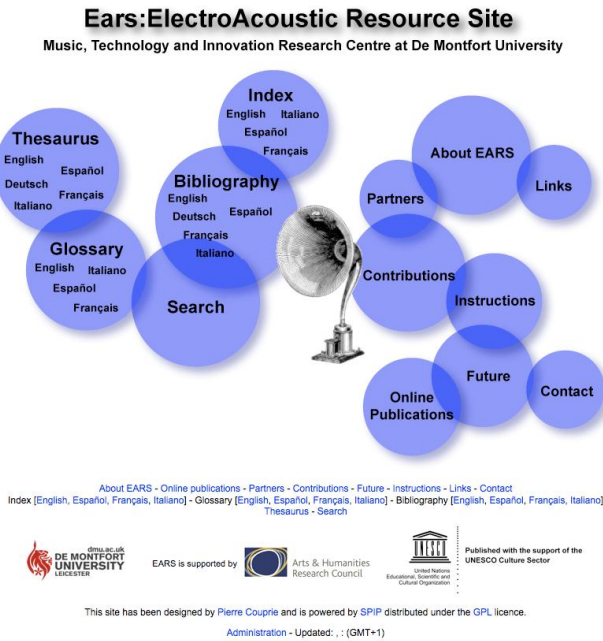


Fig. 1. The home page of the original EARS site (www.ears.dmu.ac.uk)

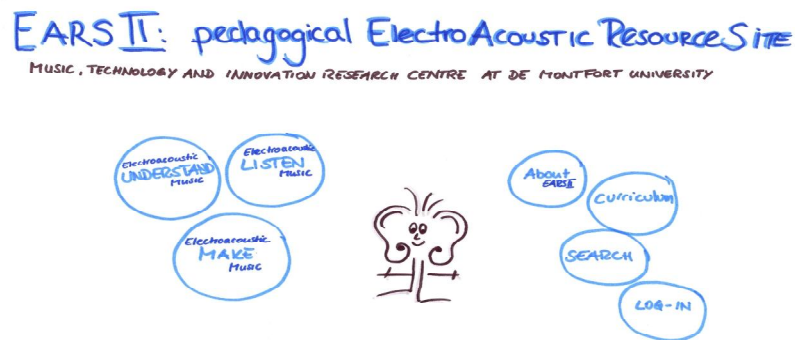


Fig. 2. This is a sample test page used by Motje Wolf with young children to ascertain whether they could respond easily to our planned forms of navigation

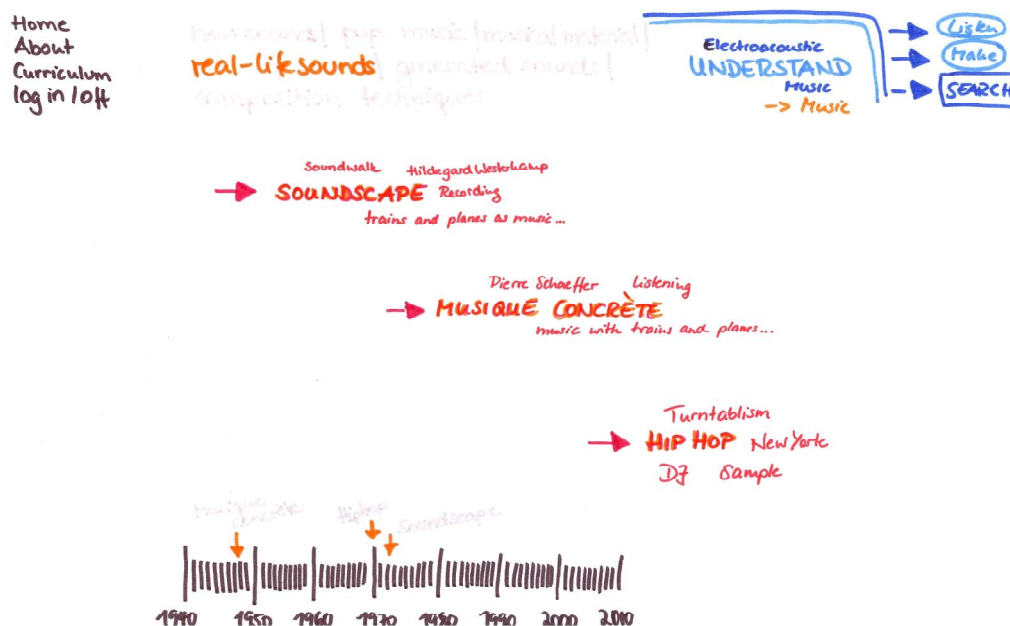


Fig. 3. This test page concerns the concept-driven approach demonstrating how real-life sounds have been used in different ways and how these types of music were introduced at different times

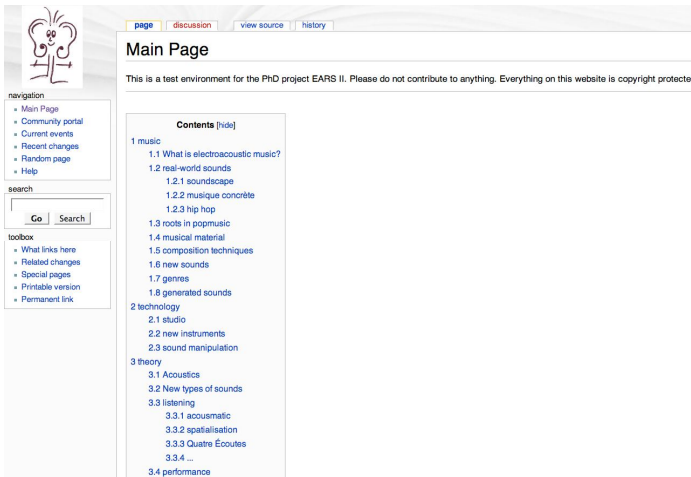


Fig. 4. Prior to using our Content Management System, Motje Wolf mocked up several test pages using a Wiki blog

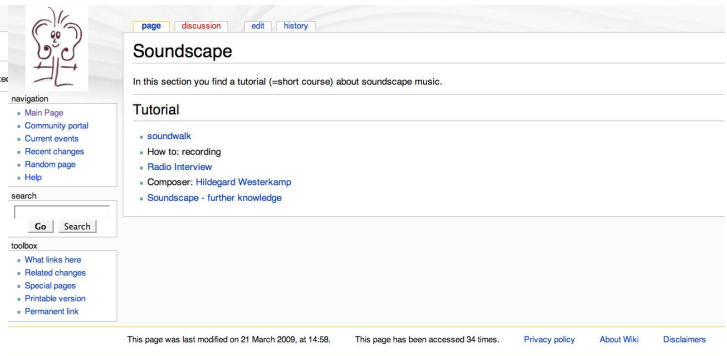


Fig. 5. This image illustrates some key headers within the Soundscape subject

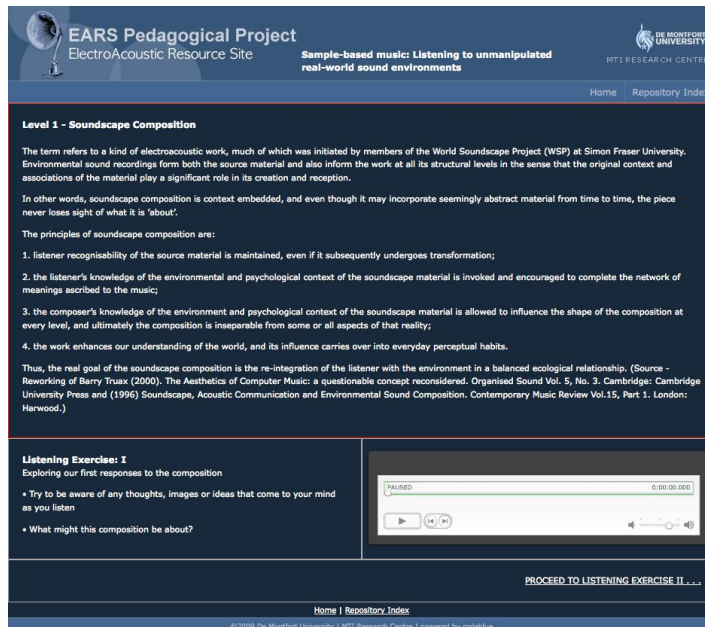


Fig. 6. This page, using the Content Management System, illustrates how Rob Weale is approaching the Soundscape subject. This web page includes a sound example

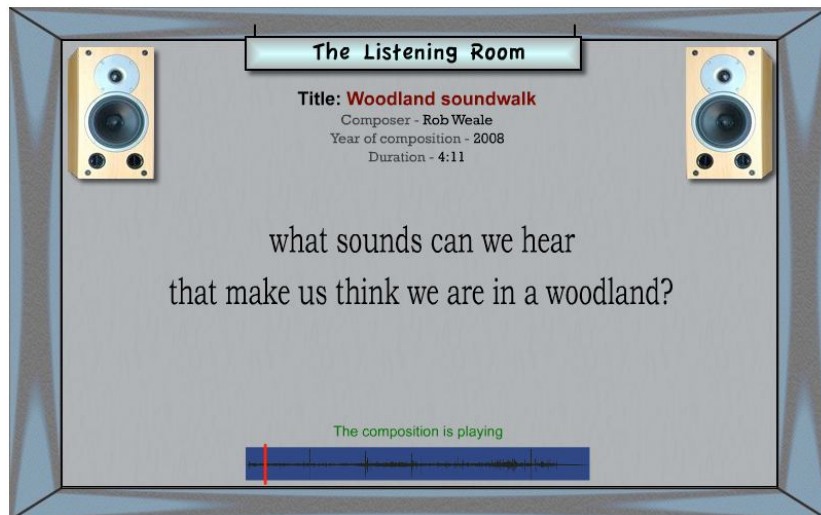


Fig. 7. One of two images representing the look of the appreciation part of EARS II



Fig. 8. As the users listen to the work, new information appears on the screen

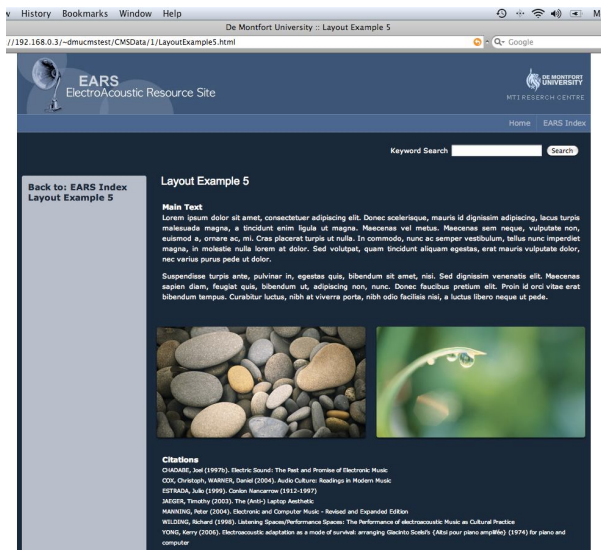


Fig. 9. This image demonstrates a test page of a potential CMS layout

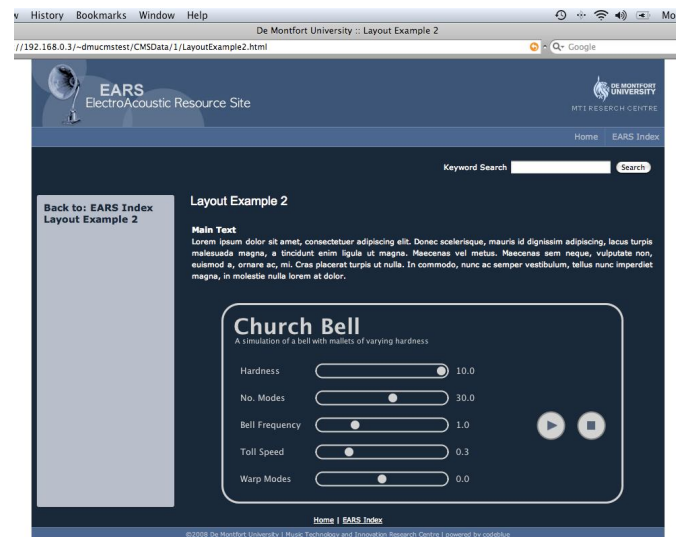


Fig. 10. This sample CMS layout includes an applet for real-time audio manipulation. Movie and flash object can also be used



Fig. 11. This image contains a typical Sound Organiser image. Sounds can be chosen from the sound cards on top and in this field, these various forms of sound manipulation take place

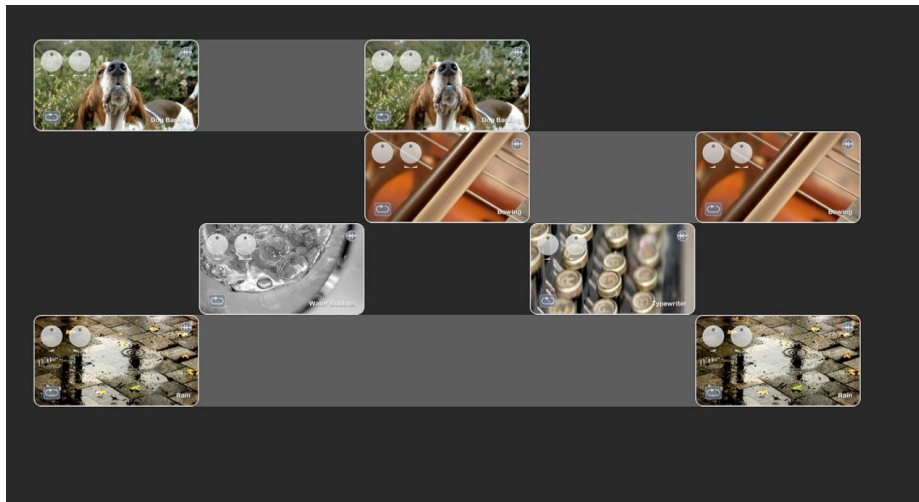


Fig.12. This final image illustrates how sounds can be chosen and sequenced within the Sound Organiser environment. Sound manipulation can be organised for each chosen sound within this layout

6. Conclusion EARS II, when made available, will offer one of the greatest access tools in the history of sound-based (or electroacoustic) music, namely a complete, holistic learning environment intended to support people of all ages, in particular children and early undergraduate students who will be able to find their way into the music, its underlying theory and means of creativity. The story of access starts by offering people a greater musical choice than what mass media and most schools are currently offering. Once people are aware of this music and have been introduced to it through appropriate concepts, sound examples and the ability to make this type of music on their own, the awareness surrounding sound-based music will increase significantly and gain its rightful place alongside many other types of music in today's world. In short, sound-based music will have a brighter future when more people gain access and are drawn to it.

7. Further EARS researchers Simon Atkinson (MTI, co-director), Peter Batchelor (MTI, real-time audio for EARS II), Pierre Couprie (Paris: MTI/Sorbonne, former EARS researcher, French translation and bibliography and responsible for EARS I site) and the EARS advisory consortium: Rosemary Mountain and Ricardo dal Farra (Concordia University, Montreal, Spanish translation and bibliography), Marc Batter (Sorbonne), Joel Chadabe (EMF), Martin Supper (Universität der Künste Berlin, German translation and bibliography co-ordinator) and Kenneth Fields (University of Calgary and Central Conservatory of Music, Beijing). Development partners for EARS II thus far include: INA/GRM (Paris); ZKM (Karlsruhe); EPHMEE (Corfu); CEPISA (Lanús); Universität der Künste, (Berlin); and the Chinese Electronic Music Center (Beijing). Other translators include Laura Zattra (Italian), Katerina Tzedaki (co-ordinator for Greek), Antonio Sousa Dias (Portuguese), Zhang Ruibo (Mungo) (Mandarin Chinese). Stephen Brown (De Montfort) is responsible for knowledge media design.

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