# Blended Music Instruction:

## *Enhancing Music Courses with Web-Based Activities*

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Presented 24 September, 2011

**THE SECOND INTERNATIONAL SYMPOSIUM OF MUSIC PEDAGOGUES**

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**Abstract**

This paper identifies methods and strategies for integrating web sites to support traditional classroom music learning. The term "blended" refers to the use of various media types that complement instructor-led activities. It is also known as "hybrid" instruction, which may involve online components and a course management system. A survey of non-commercial internet sites that provide drill and assessment of music fundamentals is presented, along with tables comparing features. The knowledge and skills addressed by these sites, and in the classroom, are of two general types: written and aural. The written component refers to the identification of notes, scales, key signatures, intervals, chords, rhythms, and relationships between them. The aural component is the ability to identify musical elements by ear. These basic materials are addressed in integrated music theory courses that teach literacy and musicianship. Advantages offered by online support for such courses are identified. Pedagogical strategies for the classroom component of blended music theory courses are proposed. Methods for online diagnostic testing are discussed. These tests determine the level of knowledge and skills students possess, a critical factor in planning instruction, setting goals, and advising students for proper placement.

**Keywords**

web-based music instruction, online ear training, music theory drills, online music learning

# Overview of Educational Websites for Training Fundamental Music Skills

The web sites discussed here are either non-commercial, or they are offered free of charge by a host that offers other activities for which there are subscription fees. All of the activities described are available at no cost at this point in time, but there is no guarantee that they will remain free. Several of these sites have been online for over ten years, and have become well established since being reviewed in Music Theory Online, *The Online Journal of the Society for Music Theory* (Raschke, 1999). A brief overview of the eight sites chosen for inclusion in the two comparison tables follows.

**Teoria (http://teoria.com)**

Developed by Jose Rodriguez Alvira in Puerto Rico, this is a comprehensive bilingual site that includes both aural and written modules. It began as a collection of interactive Java applets entitled "Practical Music Theory" in 1997. The activities are highly configurable by the user, with many choices available for each exercise. It includes well-conceived dictation exercises in harmonic progressions, melodies, and rhythms. It advances beyond fundamentals in the area of chromatic harmony and includes jazz chords and modes. The interface is attractive and intuitive, and in most exercises allows both construction and identification. A great deal of ancillary information is found on the site, including analysis and articles about music.

**Musictheory (http://musictheory.net)**

Developed by Ricci Adams in Illinois, this site has been online continuously since 2000. It is built in Adobe Flash, a flexible technology that has become a standard on the web. Having undergone a major revision recently, the site is now more oriented towards tutorials on theoretical concepts than on basic training modules. The original version of the site referred to as the "classic edition," is available as a stand-alone program that can be downloaded. The current version of the site includes aural activities that drill intervals, scales, and chords. It has always been very customizable by the user, with a choice of parameters and instruments for each activity. This site has become a benchmark for free music theory training online, and is the most frequently recommended resource in this category.

**Muzikologija (http://muzikologija.ff.uni-lj.si/ptg)**

Music Theory Concepts is the English title of this bilingual site. It is a part of the Computer-Assisted Music Theory Learning project, directed by Dr. Leon Stefanija and Dr. Nico Schüler. It was developed as a part of the permanent learning program at the Slovenian Ministry of Education and Sport in cooperation with the European Social Fund, and is hosted at the University in Ljubljana. A number of authors have contributed, and others are openly invited to participate. The site includes an attractive environment for the very young student, as well as more advanced information and training modules for adult learners. The interactive training modules are developed in Flash.

**Musiccourseware (http://www.musiccourseware.net)**

This is the home of ***Music Theory Mastery***, an interactive site that addresses a wide range of written and aural skills. It was developed in 2004 by Dr. Brad Hansen at Portland State University in Oregon, originally as a tool for delivering automated Diagnostic Theory Placement Exams for incoming students. It operates in two modes, practice or assessment. Instructors are able to configure tests and practice modules from a pool of two dozen different activities, and test results are reported in a database. The site is used for drill and practice in the music theory curriculum as a component in ear training and basic theory courses. In both modes a timer on screen shows the user how many seconds have elapsed for each problem. In practice mode the user is given three attempts to get the correct response, then the solution is shown. No data is recorded in practice mode.

**Thetamusic (http://trainer.thetamusic.com)**

Theta Music Trainer is a commercial site that offers extensive information about music fundamentals, and allows users to practice at elementary levels with a number of activities. All of the activities are presented in a game format, and the interface is very well designed graphically. The site is intuitive to use, and would appeal to a wide range of ages and abilities. Scales, melody, intervals, harmony, rhythm, and other topics are included. There are succinct tutorials with illustrations on each topic, followed by one or two games to play while applying the concepts.

**eMusicTheory (http://www.emusictheory.com)**

The current eMusicTheory site is a commercial enterprise launched in 2003 by Rob Whelan, a java programmer. It originated as "Java Music Theory" in 1997. There are a few basic configurable exercises offered for free use, such as identifying and building intervals, scales, and chords. Other activities include fingerings on stringed instruments. The interface is rudimentary in design, and the sample quality is unlike natural instrument sounds. The site is primarily designed to sell access to teachers and their students.

**Learn2hear (http://www.learn2hear.org)**

This site addresses aural skills exclusively. It was developed by students at the University of Aarhus in Denmark, and operates in the Java Runtime Environment. Exercises train and test intervals, scales, triads, and tetrads. In practice mode the user can configure settings for their preference. Examination mode adapts to the ability of the user, a unique feature among this type of program. It records and displays correct and incorrect answers on screen. The graphic design is striking, while the interface is rudimentary but functional. User controls include the register of the sound and the length of tones. High scores are recorded, and there is a list of "Supreme Users" that have excelled at the most challenging levels.

**GoodEar (http://www.good-ear.com/servlet/EarTrainer)**

This site also addresses only aural skills. It was developed using Visual Basic by Martin Schoeberl, and has been online for many years. The interface design is rudimentary, not visually stimulating, but highly configurable. The user can customize numerous features, including tempo, range of pitch, and the instrument sample sound. Along with intervals, scales, chords, and cadences it also offers modules on jazz chords, note location and perfect pitch. The user must click three times and use drop-down menus to answer each question.

**Other Non-Commercial Music Sites**

There are a number of other free sites that provide activities related to music theory, both written and aural. Those described above exhibit a high level of interactivity, a range of activities, and stability. Some of the others are listed below.

**http://www.therhythmtrainer.com**

Addresses only rhythm, but very effectively. Written in Flash by John Blank. (2007)

**http://www.ossmann.com/bigears/index.html**

Big Ears drills only intervals. Written in Java by Michael Ossmann. (1996)

**http://www.gmajormusictheory.org**

A range of contextual listening activities. Created by Gilbert DeBenedetti.

**http://www.solfege.org**

GNU Solfege is open source code for a stand-alone program that must be installed. It drills a range of skills, and allows vocal input for solfege evaluation.

## Tables Comparing Features of Music Theory Learning Sites

This is by no means an exhaustive reference. It is intended to be an objective and general guide for students and instructors who wish to employ some online components at no cost in the study of music theory. Using the following criteria, the following tables identify various features of each site described in the overview above. Table A shows the range of free activities provided by each site in Aural, Written, and Keyboard domains. Observations are also made about the Configurability and Usability of each site, as well as the overall design.

In Table B the functional criteria, such as Operational Modes, Feedback, Sound Source, and Languages are identified. Along with these are notes on the Technology used, and whether the site has record keeping and reporting capabilities.

### Criteria and Symbols Used in the Tables

If an activity or feature is present in the free exercises offered by the program, a plus (+) appears in the box. If there are multiple exercises or if the features exceed criteria, two pluses (++) appear. If an activity or feature is not present or not applicable, a dash (-) appears in the box.

Table A begins with a summary of Aural, Written, and Keyboard activities, and identifies Customizable features and Usability. The activities identified in the Aural range are Intervals, Scales, Chords, Melody, Harmony, and Rhythm. The same parameters are measured in the Written category, with the omission of Melody and addition of Notes and Key Signatures. The Keyboard range of activities includes Notes, Intervals, Transposition, and Chords. Degrees of Configurability that are rated include Difficulty, Length, Speed, Range, and Sounds. Usability factors rated are the degree of Intuitiveness, Efficiency, and the Use of Color in the design.

Table B identifies Modes of Operation, which include Drills, Tests, Tutorials, and Tools. Tools are ancillary functions, such as a 12-tone matrix generator, or a table of frequencies. Feedback is described as being Immediate, Clear, and Useful, while Reporting refers to the capability to generate and store a summary of student performance. Sound sources are identified as internal MIDI or Samples downloaded, and a rating of Realism is listed. The category of Languages includes Spanish, Japanese, Slovenian and English. The Technology used to develop and deliver the program is identified, and the common tools used to enhance the basic HTML are Flash, Java, SQL/Perl, and Visual Basic. The final technical feature is whether the program can be downloaded and run as a stand-alone application on a computer that is not networked.

**Web Sites Included in the Survey Tables**

The eight sites described in the overview above are compared in two tables that follow. They are identified by the following short names.

- **Teoria (http://teoria.com)**
- **Musictheory (http://musictheory.net)**
- **Muzikologija (http://muzikologija.ff.uni-lj.si/ptg)**
- **Musiccourseware (http://www.musiccourseware.net)**
- **Thetamusic (http://trainer.thetamusic.com)**
- **eMusicTheory (http://www.emusictheory.com)**
- **Learn2hear (http://www.learn2hear.org)**
- **GoodEar (http://www.good-ear.com/servlet/EarTrainer)**

| TABLE A | | Teoria | Musictheory | Muzikologija | Musiccourseware | Thetamusic | eMusicTheory | Learn2hear | GoodEar |
|---|---|---|---|---|---|---|---|---|---|
| AURAL | Intervals | + | + | + | + | + | + | + | + |
| | Scales | + | + | + | + | + | + | + | + |
| | Chords | ++ | + | - | ++ | + | + | + | + |
| | Melody | + | - | + | + | + | - | - | + |
| | Harmony | + | - | - | + | + | - | - | + |
| | Rhythm | + | - | + | + | + | + | - | - |
| WRITTEN | Notes | + | + | + | + | + | + | - | - |
| | Intervals | + | + | + | + | + | + | - | - |
| | Scales | + | + | + | + | + | + | - | - |
| | Key Signature | + | + | - | + | + | + | - | - |
| | Chords | ++ | + | + | ++ | + | + | - | - |
| | Harmony | ++ | + | + | + | + | + | - | - |
| | Rhythm | + | + | + | - | + | - | - | - |
| KEYBOARD | Find Notes | + | + | + | + | + | + | - | + |
| | Intervals | + | + | - | + | - | - | - | - |
| | Transposition | + | - | + | + | - | - | - | - |
| | Chords | + | + | - | - | - | - | - | - |
| CONFIGURABLE | Difficulty | + | + | + | + | + | + | ++ | + |
| | Length | + | - | + | + | - | - | + | + |
| | Speed | + | + | + | - | - | - | + | + |
| | Range | + | + | + | - | - | - | + | + |
| | Sounds | + | + | - | - | - | - | - | + |
| USABILITY | Intuitive | + | + | - | + | + | + | + | + |
| | Efficient | + | + | - | + | + | + | + | - |
| | Use of Color | + | + | ++ | + | ++ | - | + | - |

Table A. Survey of Aural, Written, Keyboard, Configurable, and Usability Features

(+) = Feature present; (++) = Multiple instances; (-) = Feature not applicable

| TABLE B | | Teoria | Musictheory | Muzikologija | Musiccourseware | Thetamusic | eMusicTheory | Learn2hear | GoodEar |
|---|---|---|---|---|---|---|---|---|---|
| MODES | Drills | + | + | + | + | + | + | + | + |
| | Tests | - | - | - | + | + | - | + | - |
| | Tutorials | ++ | ++ | + | - | + | - | - | - |
| | Tools | + | ++ | + | + | + | + | - | - |
| FEEDBACK | Immediate | + | + | + | + | + | + | + | + |
| | Clear | + | + | + | + | + | - | + | + |
| | Useful | + | + | - | + | + | - | + | + |
| | Reporting | - | - | - | ++ | + | + | + | - |
| SOUND | MIDI | - | + | + | + | + | - | - | - |
| | Samples | - | - | + | - | + | + | + | + |
| | Realistic | - | - | - | - | - | - | - | - |
| LANGUAGES | English | + | + | + | + | + | + | + | + |
| | Spanish | + | - | - | - | + | - | - | - |
| | Japanese | - | - | - | - | + | - | - | - |
| | Slovenian | - | - | + | - | - | - | - | - |
| | Other | - | - | - | - | - | - | - | - |
| TECHNOLOGY | Flash | - | + | + | - | + | - | - | - |
| | Java | - | - | - | - | - | + | + | - |
| | SQL/Perl/PHP | - | - | - | + | - | - | - | - |
| | VB | - | - | - | - | - | - | - | + |
| | Other | - | - | - | - | - | - | - | - |
| | Downloadable | + | + | - | - | - | - | - | - |

Table B. Survey of Modes, Feedback, Sound, Language, and Technology Features

## Strategies for Incorporating Web-Based Training in Music Courses

The Ear Training component of music learning is a good candidate for the use of technology. In a traditional scenario, teachers conduct drills with an instrument, repeating intervals, melodies, and chords for dictation. This approach does not engage a student at his or her individual level of ability, is inconsistent, tiring, and does not take into account diverse learning styles. A richer and more self-directed learning experience is provided by enhancing a music course with online components (Gandell, et al, 2000). In a recent study it was demonstrated that music students improved significantly in their ability to discriminate melodic intervals with the use of Web-based training (Loh, 2004).

The question is not whether using online support for music learning is valuable or effective, but rather how to best integrate it with other modes of instruction. The information given thus far describing resources online to support music learning can be used to choose a suitable site for a given group of students and a set of learning objectives. Once the instructor has selected the appropriate resources to include in the instructional plan, there are a number of ways to expose students to these resources outside the classroom. If students have access to the Internet at home, at a library, or in a computer laboratory they only need a pair of headphones to practice aural and written skills. Some instructors allocate a percentage of final grades to computer- or web-based testing in ear training courses, and use a site or software that reports test results. It has been observed that if exercises are not graded, students may not use them (Spangler, 1999).

There may be situations where students need assistance in harnessing the technology required to engage in web-based training. Accommodations should be made for these students, and time allocated to ensure that all students have a productive experience. This may require a presentation to the class demonstrating the methods of accessing a prescribed site, and how to benefit from online activities. Helping students access the Internet for learning applications pays dividends in their self-sufficiency and capacity to use this tool for life-long learning applications. Web-based applications will proliferate due to platform independence (Lake, 2002).

**Teach Problem Solving Skills, not Drills**

Pedagogically, the option of using web-based training to support classroom instruction opens many doors. Blended learning helps instructors evolve as designers of active learning environments, thus becoming much more facilitative in their teaching (Dziuban, et al 2004). Class time is precious. The advantages in allocating drill, practice, and testing to online media are evident in the time saved for engaging in musical activities. Research in music learning theory is useful in understanding how to best assist students in solving aural problems. It was proposed by Fiske (1985) that pitch discrimination occurs in three stages: perception, comparison, and *schemata* formation. A student hears an interval, compares this sensation to prior experiences, and then forms a schema for recognizing and recalling the name for it.

Addressing a typical aural problem, such as identifying the quality and inversion of a triad, students benefit from having a strategy, or series of steps that will result in the correct response. The steps might be to 1) identify the root and sing it, 2) outline the triad upwards from the root to determine the quality of the third, 3) compare the bass note to the other triad members and identify it. If students learn to trust their instincts and ability to follow a similar process, they develop confidence. This confidence translates into success. As students improve at identifying inverted triads, they will be able to *audiate*, or hear the pitches they were singing silently. The ability to audiate, or hear music in one's mind, is one of the goals of ear training (Gordon, 1997).

**Focus on Deeper Learning by Providing Context**

An isolated musical construct, such as a note, interval, or chord is merely a building block in the larger context of a piece of music. While it is important initially to master the aural and written skill to identify the building blocks, understanding concepts that integrate to make the musical whole is a higher learning objective. Looking for patterns in music, seeing and hearing them in a variety of contexts, is the next step towards problem solving and thinking critically about music. The structural components of phrases, cadences, and sections in music become evident when students apply their knowledge of building blocks to understand the architecture. Then the concepts of balance, proportion, unity, and variety can be examined.

**Orchestrate Peer to Peer Interaction**

For many students, the social and cultural environment in the classroom is crucial in determining their success and willingness to participate fully in the music learning process. The instructor's lesson plan might be a secondary concern. Experienced instructors are aware of and sensitive to the social and cultural context for learning. For example, solo solfege performance can be stressful in class, but singing canons in three or four parts engages students with their peers and serves the same purpose. It is possible to praise any honest effort while holding high standards for achievement.

Musical games can be learning experiences and give students positive feelings about studying music. An old fashioned "Spelling Bee" is a useful vehicle. Two teams of students compete in spelling triads, seventh chords, secondary dominants, or augmented sixth chords. Each team challenges the other with questions, someone keeps time, and the instructor serves as a referee. In activities like this, all students are engaged and interacting while trying to determine the correct answer.

**Respect Different Learning Styles, Ways of Processing Information**

Much has been written about learning styles, and ways in which learners most effectively absorb and internalize knowledge. Kolb first identified the three categories of learners as visual, auditory, and kinesthetic. Structuring learning to accommodate student preferences for reading, or listening, or engaging in activities with others could prove beneficial. The fourth and most powerful category of learning is experiential. The four elements of experiential learning have been defined as 1) concrete experience, 2) observation and reflection on that experience, 3) formation of abstract concepts based upon the reflection, and 4) testing new concepts (Kolb, 1984). This theory fits music training well, as it often involves performance of an activity and immediate feedback that assists the learner in modifying behavior to get the desired results. Music has been identified as a form of intelligence (Gardner, 1999), and is now being studied as a distinct knowledge domain (Taetle & Cutietta, 2002).

## Diagnostic Music Theory Placement Tests Online

Preparation for music courses in higher education can vary widely between students. This may be due to their degree of exposure to the subject matter, or to their inherent talent. Beginning a course with a general background assessment yields data to help students enroll at the appropriate level and avoid false starts and schedule changes. This is especially important in situations where there are multiple options for students. While some schools conduct testing at an audition, many instructors deliver a diagnostic test at the beginning of the term. This can be a laborious and inefficient method of gathering data.

A number of music schools in the United States administer diagnostic music theory placement tests online. The Oberlin Conservatory in Ohio uses an extensive automated examination at http://www.oberlin.edu/octet/PlacementExam/MusicTheory. Some schools offer practice tests online so that students can prepare, such as the State University of New York at Fredonia at http://www.fredonia.edu/music/theory/theoryplacement.asp. Another option that some schools use is embedding a placement test for enrolled students in a course management system.

One of the tools we have used at Portland State University is a Theory Placement Exam online at http://www.musiccourseware.net. It is used to test both written and aural skills. The test may be taken at any time by the student and results are reported to a data base accessible by the instructor. The practice mode of the *Music Theory Mastery* program can be integrated in the curriculum to strengthen performance and remedy deficiencies.

## Summary

The primary purpose of this paper has been to expose educators to free online materials that can enhance classroom music teaching. The survey of sites and comparison tables describe options for drills and tests outside of the classroom. Pedagogical strategies for maximizing time with students have been proposed, and web-based methods for placement testing identified. Hopefully, this has answered questions about available resources and how to leverage them.

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