

# Using Technology to Record Student Performances

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## **Kelly Demoline**

*Kelly Demoline is a music educator and president of Kelly's Music & Computers. In addition to his K-12 teaching experience, Mr. Demoline has also taught Music Technology for Brandon University along with many music education organizations throughout North America & Europe. Mr. Demoline can be reached by e-mail at [kellyd@kellysmusicandcomputers.com](mailto:kellyd@kellysmusicandcomputers.com)*

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Recordings of student performances are effective tools for providing instruction and assessment. Recording individuals, small groups and ensembles can be a motivating learning experience for students. Two methods for quickly and easily creating digital recordings include computer based recording and portable digital recorders.

## **Why Make Recordings of Student Performances?**

Having students listen to both professional and student recordings can provide valuable teaching opportunities. Encouraging students to compare their own current performance to a previous performance can help to identify improvements and is a motivational way of helping students to set goals for practicing. If presented in an appropriate manner, allowing students the opportunity to compare their performance with a professional can also help them to identify current success while inspiring them to find achievable goals to make their recordings more musical.

Although students can often readily identify pitch and rhythmic errors, or express their attitude towards their performance in general terms without the use of a recording, focusing on an actual performance can help them to identify specific musical elements related to the "big picture" of their performance. This can be especially useful in an ensemble situation, where students can move beyond focusing on their own specific part, and understand their role in a larger ensemble.

For example, drawing attention to phrasing, balance and dynamics is much easier when students have an aural picture of what they currently sound like, along with a goal to work towards. Recordings of their performance can help achieve that and provide teachable moments through guided discussion of the various musical elements of their performance. Asking students to develop their own musical goals based on these recordings and discussions can provide an instructional style that varies from the typical rehearsal scenario. Recognizing the effects of concerted efforts towards improvement by evaluating a "before and after" recording can help motivate students towards achieving their musical goals.

Student recordings can also provide an opportunity to teach creativity and to assist in aural skills development. For example, students can use digital recording tools to easily create multi-track recordings that layer different instruments. Asking one student to record an improvised rhythmic track over another student's melody, or challenging

students to record a harmony track or background vocals can be an exciting way to encourage students to develop creativity. Using student created aural skills exercises, such as melodic or rhythmic dictation, can be much more exciting for students and often provides a fun challenge to both the students that prepare the material, and the students that are tested.

Aside from their role as a teaching tool, recordings are most commonly used for assessment purposes. Providing students with a rubric for self assessment can help ensure that students evaluate their performances beyond just the correct pitches and rhythms and listen for musicality. Students need to be encouraged to identify positive attributes in the performances, in addition to items for future practice. This is especially true in peer assessment, where it is important that students gain a sense of respect for the abilities of their peers, along with a confidence in their own abilities. Peer assessment can help foster recognition of musical individuality and diversity while also providing new insights into interpretation and phrasing. Peer assessment can provide an exciting avenue to encourage students to develop critical listening skills and to use those skills to explore new musical ideas.

Using a digital recording of a student performance for teacher assessment provides a convenient way of providing useful feedback to students. It is not always feasible to provide the immediate feedback required in a classroom situation, and even in private lessons, there are times when it may be more useful to review a student performance afterwards and provide comments. Students can also prepare recordings independently - giving you the opportunity to provide feedback on performances made outside of when you usually hear students. This can be a valuable way to gain insight into their practice techniques and may give some students a sense of freedom that they might not feel in a one-on-one or classroom situation.

### **How Can I Easily Create Digital Recordings of Student Performances?**

There are two popular methods for easily creating digital recordings of student performances. Portable digital recorders provide a convenient and easy way to create recordings, while computer based recording offers power and flexibility.

Portable Digital Recorders, such as the R-1 and R-09 from Edirol, or the MicroTrack 24/96 from M-Audio, are a popular choice for teachers that want an easy way to make recordings without needing to set up a lot of gear. As implied by the name, portable digital recorders are small - the R-09, for example, weighs only 6 oz (145g) and is a mere 2.5" tall, a little more than 4" wide and slightly thicker than 1" (62.6 x 102 x 29.1 mm). Despite the small size, these recorders all offer high quality and professional features.

The small size means that they can also be powered by battery, so you don't have to worry about finding a power source. In fact, the R-1 and R-09 even include professional quality built in microphones, so you can literally record anywhere and at anytime. The MicroTrack includes a removable stereo mic, and all three will allow you to connect external mics should you choose to set up stands and work with larger microphones. If you are recording from a keyboard or other line level device, you can also connect these directly to the units. The MicroTrack, for example, includes two 1/4" inputs while the Edirol devices offer 1/8" stereo inputs.

All three devices record to the same memory cards found in digital cameras or MP3 players (both the R-1 and MicroTrack use Compact Flash, and the R-09 uses SD.) If you

plan on burning a CD, you can record to WAV files for the highest quality results, or, if you plan on e-mailing or posting recordings to the web, you can also record directly to MP3.

Recording is simple - just turn on the device and hit the record button. You can use the up and down buttons to adjust levels, and there are more advanced options available for controlling the file type created (MP3 or WAV) and various bit depths and sample rates. However, once these are configured the first time, you don't have to worry about them again - just hit record when you are ready to go. The R-1 and R-09 include a built in limiter so you don't need to worry as much about adjusting the levels. The R-1 also includes built in effects, such as reverb and mic modeling to provide even more professional results.

Once you are finished recording, you can transfer the files to your computer via a simple USB connection, or if you prefer, you can also remove the SD or CF card if you have a card reader installed on your computer. Burning a CD or editing your recordings is simple - we will examine this in more detail in the next section on computer based recording. The MicroTrack comes with headphones so that you can listen to your recordings if a computer isn't available, and all three allow you to connect to speakers or a sound system for playback.

Portable Digital Recorders are both portable and easy to use, while providing high quality results. They are durable and with just a few minutes instruction on their use, students will be able to make their own recordings without the need for teacher assistance. Ready to start recording in seconds, you can use portable digital recorders to capture any musical moments - from large ensembles to student solos.

Computer based recording isn't as simple as simply pressing the power key and then hitting record, nor is a laptop and soundcard as portable as the R-1, R-09 or MicroTrack. However, while portable digital recorders usually limit you to recording in stereo, you can record multiple tracks into your computer. You can also easily re-record tracks, add instruments and apply effects.

In addition to a reasonably fast computer, you will need a high quality soundcard or audio capture device, microphones, recording software and ideally some good speakers. To connect your microphones, keyboards, guitars, and other devices to your computer, you can choose from PCI soundcards that you install inside your computer, or select a USB or Firewire audio capture device. All three options will provide excellent results, but if you don't want to open up your computer, if you have multiple computers, or if you have a laptop, USB or Firewire is the better choice as it makes connecting and disconnecting very easy. In fact, some USB or Firewire soundcards are "bus powered", which means they don't need a power adapter - instead, they get the power from your computer.

While portable digital recorders are limited to the stereo (two channel) recording, you can purchase soundcards that support up to 8 or more inputs. This allows you to mic each section of your ensemble separately - such as mics for the winds, brass, and percussion, along with line inputs from your keyboard and guitar. Should you need to adjust the levels afterwards, or re-record specific sections, this is easy to do, since each section is recorded onto a separate track. Be sure to select a soundcard that has the number and type of inputs you need - our soundcard buyer's guide explains the various

options, and even includes a selection wizard that can help you decide exactly what you need.

Once you have connected your soundcard to your computer and installed the necessary drivers that came with it, you will be able to connect your mics or other recording devices to your computer. If you plan on connecting mics directly to your computer, I highly recommend choosing a soundcard that has built in mic pre-amps. Depending on your microphones, you may also need a soundcard that offers phantom power. Check the documentation that came with your microphone if you aren't sure if it requires phantom power - most condenser mics do. If you don't already have microphones, our buyer's guide can help you understand the various options available.

Now that you have everything connected, you will need some software on your computer to create the actual recordings. If you plan on recording more than two channels - in other words, if you plan on recording from more than two sources at once - you will need a multi-track recording program. PowerTracks, Sonar, Cubase and Pro Tools are all popular choices, and our buyer's guide helps explain how to select a multi-track program. In fact, you will find a complete list of products available, along with demos, a comparison chart and a product selection wizard that can make recommendations based on your answers to a few simple questions.

Depending on the soundcard or audio capture device you choose, you may not need any additional software. For example, Edirol includes Sonar LE with many of their products, which is a suitable entry level program for audio recording. M-Audio has some bundles that include Pro Tools M-Powered, which is perfect if you plan on eventually taking your music to a studio for mastering, or want to provide students with hands-on experience with the software used by professional studios. Many other soundcards include Cubase LE, which is another good starting point for audio recording. The only problem with "LE" software is that it is usually unsupported - which means that if you run into problems, there isn't anyone to turn to for help. For that reason, you might want to consider if there are any good books or video tutorials available for the software package you are considering before you make your purchase.

Other companies, like Cakewalk, have created a special bundle that gives you the software and hardware in one package - with one instruction manual and one number to call for tech support. If you are new to computer based recording, don't overlook the importance of having one point of contact, so that you don't have to go back and forth between the soundcard manufacturer and the software developer should things not work like they are supposed to!

Once your software is installed, you are ready to start recording. Be sure to check the levels on your mics or keyboard to make sure that your soundcard is properly receiving the signal before starting to record. Most software includes a virtual mixer, which allows you to see and adjust levels for each channel, along with the overall volume. When you are ready to record, just hit the record button and you are ready to go!

Unlike portable digital recorders, editing your audio on your PC is very easy. You will see a graphical representation of all of your tracks, and you can easily cut, copy and paste sections. You can also use built in effects for adding reverb, removing noise, or even adjusting the pitch! Most programs include built in effects, but for more advanced work,

you may consider purchasing audio plug-ins that offer the specific effects or functionality you need.

If you are only recording in stereo, or if you want to follow a more professional approach to audio recording, you might also consider using audio editing and mastering software. Unlike multi-track recording software, these programs usually only allow you to work with stereo recordings. Keep in mind that to burn a CD, all of your music must be in stereo anyway - you can't burn each channel of your recording separately onto a CD - it must be mixed down to stereo first. Audio editing and mastering software will help you ensure that your music sounds great on any system and will allow you to apply further effects, such as normalization, to ensure that you don't have to change the volume for each song on your CD when listening to it at home!

There are also some specialty programs or add-ons that can add additional instruments to your music, such as virtual drums or guitars. These types of programs can unleash creative potential in your students and motivate them to become more involved in the recording process. Other tools, such as programs like Melodyne or Auto-Tune, will allow you to correct pitch errors and make other adjustments.

Good speakers (or monitors as we sometimes call them) are often under looked when it comes to computer based recording. Without accurate monitors, your impression of your recording will be coloured, and when you play your final CD on another system, you will be surprised to discover how much different it sounds on each system. This can be overcome by using monitors that give you a clear sonic picture of your music - hearing each detail is important, and the speakers that came with your computer won't provide the clarity you need. You don't have to spend a lot on speakers, and you don't necessarily need them to be really loud, but do consider investing in some good quality speakers to ensure you and your students are really hearing your music. Our guide will help you understand how to choose the best speakers for your needs.

Although it may seem complicated, you don't need a lot to get started with computer based recording. Once you have a good soundcard and some software, you can start making recordings. Computer based recording gives you a lot of options and flexibility, so you can add additional features and capabilities as required. However, unlike portable digital recorders, it will take a bit longer to get ready to start recording, and students will require more training if you want them to be able to record themselves.

Whichever method you choose, recording student performances can be a valuable learning tool, providing new opportunities for instruction and assessment. The process can be fun and motivating for students, while offering new avenues for learning.