Sound recording: pre-production

KS3/4/5

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Introduction

In the first of this three-part resource on recording music in schools, we looked at options for setting up a studio (*Music Teacher*, April 2023). In this second resource, we'll move on to the preparation work that needs to happen before the job of recording can begin.

Before we start, it would be helpful to define two roles that will need to be undertaken to make the recording run smoothly:

1. Sound engineer

This person is responsible for everything that happens in the studio, apart from the actual playing of instruments, which includes:

- Setting up and positioning microphones.
- Setting the levels going into and out of the mixing desk and/or any outboard pre-amps or compressors.
- The operation of the DAW and all studio hardware – this will include the setting of levels coming in, and the general operating of the recording software.
- Setting the levels of the headphones going to the musicians.
- The positioning of instruments and management of the room.

2. Producer

The producer's job is more to make sure that everything runs smoothly, and that the recording session is productive and efficient. The producer will normally take a more creative role, and will advise on anything from song arrangement to mic placement, but is generally not so involved with the nuts and bolts of the recording and more with the overall picture. Having said that, there are many producers who will also engineer the session, and are very hands-on when it comes to the recording process.

What is pre-production?

Pre-production is a process that happens before any recording begins. It's designed to allow the musicians and the producer to work together to iron out any problems with the music that's going to be recorded, and to help plan the actual recording session to make sure it runs as efficiently as possible.

To that end, it would be a good idea to define the roles above early on in the process. You will need to choose some able and trustworthy students to be the Engineer and Assistant engineer/s, and another student/s to be the Producer or production team. How many students you choose for these roles will depend on both the space you have, and on their general abilities. The engineers can be divided up into either control room (DAW/mixing desk operators) and live room (mic set-up/sorting out headphones/plugging in DI boxes, etc). If you don't have a separate control room, don't worry: you'll still need the same roles.

The role of Producer is a bit harder to grasp for a lot of students, so it would be best given to someone who is good at listening and is trusted by the students to give sensible, informed opinions. The Producer will need to the know the music inside out, so that they can advise about any mistakes or changes that may need to made, and they will also need to be listening to the recording as it happens to be able to say if everything sounds correct both sonically and in terms of the performance. If you think this sounds like a big task, you're probably right: it takes years of experience to become a good producer. For this reason, I'd advise that (at least initially) you the teacher are the Producer, and you have an assistant (or assistants) that you can ask questions and opinions of as and when you see fit.

Making the session run smoothly

Recording sessions in schools are always limited by time: in general, something that would take a day or more to do in a professional studio often has to be squeezed into a double lesson. If you have an understanding head teacher, you might be able to stretch to a full morning or afternoon, or if you're really lucky, a whole day. For this reason time management is crucial.

Break tasks down into two criteria:

What we have to do

If this is a double lesson, I'd highly recommend that you choose one goal – this could be the tracking (recording only) of one piece of music, or the overdubbing of one or two instrument on an existing recording. If you attempt any more than this, you will quickly run out of time. You always have to allow for the fact that mistakes are likely to happen – doing one take (recording) of a song is likely to take up to ten minutes, so multiple takes will quickly use up a lot of your time.

What we could do if we have time

This could be the recording of an additional song, adding some overdubs to the song you've just recorded, or re-recording the vocal track if it was recorded with a guide vocal. (A guide vocal is recorded with the whole band but is usually replaced due to the mic having too much bleed from other instruments.) I'd always suggest tackling the mixing of a song in a different session to the tracking of a song, so that your students approach it with fresh ears. Generally, mixing is done best with a minimal number of people involved.

An example time frame for a double lesson (two hours)

- Setting up instruments and mics: 30 mins
- Getting sounds right and checking levels: 20 mins
- Checking headphone levels and adjusting: 20 mins
- Playing through a rehearsal or warm-up: 10 mins
- Start tracking song: 20 mins
- Pack down: 20 mins

This is for a band using headphones. If the band were playing completely live, then they would have a little more time since you wouldn't have to set headphone levels.

This shows clearly how quickly your students would have to work to get anything recorded at all. With that in mind, let's look at other factors that will help you get the most out of your recording session.

Choose the room layout

During pre-production, your students need to think about the layout of the room and how to make the best use of the space, both sonically and logistically. When thinking about this, take into account the relative volumes of different instruments and how much they will bleed onto other mics. If you set up an acoustic guitar next to a drum kit, for example, the acoustic guitar will have so much drum kit on it that it will be pretty much unusable, and definitely unmixable.

Here are some guidelines for different instruments:

Drum kit: produces a loud sound that projects in all directions and will get on all the other mics in the room. For that reason, it's best to arrange all the other instruments relative to the drums and use baffling to stop the sound of the drums getting on their mics.

Guitar amp: can produce a loud sound too, but with careful mic placement you can minimise the bleed from other sound sources. Equally if you position the amp in the right area of the room, obscured by some kind of baffle, you can minimise how much guitar will bleed onto other mics.

Bass amp: this will generally be DI'd, but can also be miked. If it's just DI'd, it can be kept at a low volume just to give some presence in the room, but not loud enough to bleed too much. If everyone is using headphones, then a DI may suffice, eliminating bleed altogether.

Vocals: in general terms, if the vocals are to be recorded in the same room as the rest of the instruments, the singer is best to sing a guide vocal and be positioned away from the louder instruments and facing towards them so that the pick-up pattern of the mic eliminates as much of the sound from in front of the singer as possible. You can also use vocal reflection filters that fit on the mic stand and surround the mic, helping to eliminate bleed from other sound sources.

Making baffles

For a school, buying baffles will be a luxury, though there are many items in the school classroom you can use to make low-cost temporary solutions. Tables can be turned on their sides or ends, and used to screen off areas of the classroom. Most schools also have freestanding display boards which are ideal as they're made from softer material that will absorb sound better. It's also a great idea to have some thick cloth handy for draping over things to increase the level of separation.

Recording a demo

A key part of pre-production, especially in a school, is the recording of a demo track. This can be done with two condenser mics set up in a stereo pattern in the room, with a hand-held recorder or even with a phone. Be careful to make sure the levels are not peaking, as you will just get a distorted mess, and also be aware that the middle of the room may not be the best place to put the mics/phone as you should try and choose the place where everything sounds the most balanced.

The purpose of the demo recording is as follows. The musicians will not know what they actually sound like recorded. This may come as a surprise to them: if they have only played live together, they will have never heard a recording of themselves. I have had many bands come to the studio to record a song, only to realise on listening back to the recording that there were some fundamental mistakes in how they were playing. These can be timing, or simply playing wrong notes, and they may have not been picked up because they had always been played that way and the bad playing has stuck. Also, a loud volume can hide a multitude of sins! It's obviously very important to correct these mistakes before the recording starts, as it's very difficult and time-consuming to do it during the recording. As the teacher, you can use the demo recording as to help the band to work on any problems in their playing.

Areas of concern might be:

- Dynamics: recording allows for a large dynamic range, so encourage this.
- Tempo: is the tempo correct for the song? Try some different tempos, and work out what the best tempo is and write it down.
- Key: does the key work for the singer? If it doesn't, it needs to be changed. Guitarists can use capos if necessary. This is a point that's usually disregarded by the musicians as they normally want to play the music in the key they've learnt it in, but it can make a huge difference to the vocal performance.
- Tone and texture: is the tone of each instrument right for the song? They may sound good individually, but how does the sound work together? Bigger is not always better. Students may also have no idea how to change the tone on an amp or tune a drumkit, and so may need some assistance.
- Structure: is the structure of the song correct? If it's an original composition, would a different structure work better?

Something that may get overlooked in the rehearsal process is the ability of the band to play the song whether or not the singer is singing. It may not be possible for the singer to sing with the band during recording, so it's very important that the band can play the song without having to rely on the singer to know where they are in the arrangement. It's a good idea to work through different scenarios like this in the practice room so that when it comes to recording, the musicians can respond to any eventuality.

Using the demo as a basis for a recording

It may be preferable to start out with a demo made in lesson time on GarageBand (or similar) and overdub parts on top of it.

So far, we've focused on bands and recording groups of musicians. A lot of music made in the classroom, however, is made on a computer. For this reason, it may be more advantageous to create the basis of a track first and then use the studio to make it sound more like a proper band recording by adding live instruments and vocals. If your students are more used to working in this way, ensure they've created a track with the correct arrangement and, more importantly, the correct tempo and key, as these things are difficult to change after additional instruments have been recorded. For this reason, it's important that they try their track out with vocals first before they start trying to overdub too many instruments on top, only to find they have the wrong key or tempo.

Working with a click

If a band is not used to playing with a click, don't expect them suddenly to be able to play with a click when it comes to the recording session. There are many very good musicians who struggle to play with a click in the studio, because it's an unnatural environment and, like anything else, requires a lot of practice to get right.

In a school scenario, if your musicians are thinking about using a click because they want to be able to chop up the audio afterwards, then by all means record with a click. Make sure, however, that the drummer is comfortable playing with the click, and that they've practised the song with it many times before. This should give you something to build on, and hopefully keep the rest of the band in time. The other musicians also need to have reliable time keeping, however, as there will always be points in a song where the drums are not playing and other musicians need to keep in time.

To make things easier, don't choose the standard click – you need something loud and cutting to be heard over everything else. For this, two different pitched cowbells or woodblocks are normally best. It may even work better to program in a drum beat to play along with if the band are struggling to stay in time.

Headphones or not?

This follows on from the question of whether or not to use a click. The issues you should consider are:

1. Can the band play the song arrangement without the singer? If so, they will probably play best when they're playing in a room together as they would normally do in a practice room. If this is the case, and if there isn't the need to chop the audio up afterwards that would necessitate a click, then this would be the best option to get the most natural performance.
2. Does the band need to hear the singer in order to play the song? If so, use headphones so that the rest of the band can hear the singer adequately. The singer would ideally be in another room to get the best separation, but they could be in the live room with the other musicians as long as there's not too much bleed from their vocals on the other mics in the room.
3. If you're using a click or doing any kind of overdubbing, then obviously the only realistic solution is to use headphones.

Listening to example recordings

It's a great idea to listen to example recordings of what your students want their music to sound like. It may be that they like the sound of the drums from one track and the guitar from another: the important thing is that they have an idea of what they're trying to achieve, and whether it's actually achievable.

This will affect everything from how the drums are tuned to what type of guitar is used. Try to encourage your students to research the sounds they're trying to achieve. It's worthwhile making this into an assignment in itself, so that they get a better understanding of what they should be doing with their instruments in terms of their tone and FX, to achieve the sound they want.

How to set up the recording studio/classroom

Drums

Get a piece of carpet or rug, or a drum mat, to put the drums on. This will stop them from moving around, and it will also cut down on sound transference. Also consider using some kind of screening to stop the drums bleeding onto other in mics in the room.

- Snare
  - Top head: a Shure SM57 or similar mic can be moved closer to the head for a tighter sound with less ring, or further away for a more natural sound.
  - Bottom head: not usually necessary, but can be added for additional snap and snare rattle.
- Rack toms: usually miked from the top as this produces the most attack. You can use a Shure SM57 or similar.
- Floor tom: usually miked from the top. As with all drums, make sure the mics are not going to be hit by an over-enthusiastic drummer, which would most likely ruin the take and the mic!
- Kick drum: usually miked from slightly inside the drum using the pre-cut hole in the drum head. If your kick drum doesn't have a hole, I'd suggest taking the head off completely as this usually produces better results than with the head on. Use a mic that's better at handling lower frequencies and high pressure levels, for example the AKG D112.
- Over heads: these are usually placed above the drum set at a height of around 95 to 112cm taken from the top of the snare drum. Setting up overheads can be tricky, as using two mics to effectively mic the same thing brings into play factors like phasing, so I'd suggest reading the following link to give you a better idea of how to setup overheads: **www.shure.com/en-US/performance-production/louder/using-stereo-overhead-miking-techniques-to-supplement-a-multi-miked-drum-setup**

Here is more general information on recording drums: www.shure.com/en-US/performance-production/louder/recording-drums-part-1-setting-up-and-microphone-technique

Guitars

- Acoustic guitars: usually miked with a condenser mic placed between the soundhole and the 12th fret, though there are many different techniques. As a general rule, the closer to the sound hole you get, the bigger and bassier the sound becomes. Carefully consider where you put the acoustic guitar in the room to minimise bleed. It may be necessary to overdub if there is too much spill from other instruments on to the mic. Here's a guide to recording acoustic guitars: **www.shure.com/en-US/performance-production/louder/how-to-choose-the-best-mics-for-the-guitar**
- Electric guitar: amps are generally miked off-centre from the middle of the speaker cone as the middle of the speaker tends to sound too bright. Here's a guide to recording guitar amps: **www.shure.com/en-US/performance-production/louder/miking-guitar-amps-tips-from-sound-pro-john-mills**
- Bass: I'd recommend that you always DI the bass. This is the quickest and easiest way to get a useable bass sound. If you want to mic up the bass amp, too then feel free to do so, but consider that you could also re-amp (feed the recorded DI bass track back through the bass amp) the DIed track later and therefore minimise spill. To mic up a bass amp, you'll need to factor in the amount of air being moved, so you need a mic that can handle high pressure levels. Similarly to the guitar amp, the centre of the speaker cone gives you a brighter sound. Here's a guide to recording bass guitar: **www.shure.com/en-US/performance-production/louder/recording-mixing-bass-guitar**

Keyboards

Keyboards should always be DIed, and it's usually not necessary to record them through an amp unless it plays a big part in how the keyboard sounds, for example a Lesley speaker on an organ, or an over-driven guitar amp.

- Piano: usually recorded with two matching condenser mics arranged in a stereo configuration to pick up both sides of the piano. Here's a guide to recording a grand piano (the same techniques can be applied to upright): **https://recordingmag.com/resources/recording-info/mics-miking/miking-the-grand-piano/**

Vocals

When recording vocals, you should use a large diaphragm condenser mic, and the singer should be located in the best possible place to avoid picking up bleed from other instruments. This would ideally be in another room, but if you're going for a completely live recording, the singer should be away from the drums, and preferably screened off. If the singer is only singing a guide vocal take which is to be replaced later, they can use a dynamic mic which will reject spill better. Here's a guide to recording vocals: **www.shure.com/en-GB/performance-production/louder/how-to-record-and-mix-vocals**

Conclusion

This is by no means a complete guide to pre-production, but I hope the information in this resource will encourage you and your students to delve deeper into the studio world. It's impossible to prepare for every eventuality, and every recording session you do will be a learning experience for everyone. The important thing is to have fun – and to record some great music, of course.