Play Guitar in 10 Minutes:
Development of an instant-learn
online music education system

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Abstract: There have long been calls for reintroduction of music into school curricula. Attempts to harness informal music interests such as rock bands have not sufficiently compensated. An 'instant learning' music education system was developed and prepared for online self-instruction. The approach is based on re-writing the music to fit the ergonomics of the player rather than the traditional approach of training the player's fingering to the demands of the music. This is done with special chords that almost inaudibly change the backing score but allow guitar beginners in particular to blend in simple one-finger chords. Low bandwidth and cost were achieved by using blogs with midi and PowerPoint downloads rather than the more common video tutorials on the web. Field trials showed that however simply explained, the system still required video and even some live tuition even for the teachers. This paper reviews the research and development for this project.

Introduction

Much has been written about a 'crisis in music education'. However, this means many different things, with potentially conflicting solutions. (Pascoe, 2005; Green, 2008). For example, some bemoan lack of learning about music such as historical knowledge of the names of classical musicians. Others see lack of learning to make music as part of a broader crisis in creativity. Some non-profit musical promotion societies seek to promote 'quality' music, performance 'excellence', its necessary skills and its appreciation. Others see the rejection of Western classical art music as a call to harness grass roots informal participative styles like garage bands.

Technological solutions such as plentiful electronic keyboards in place of costly traditional band instruments might be compatible with all of the abovementioned considerations. They can be played starting from the simplest one key at a time synthesizers that have now replaced wooden xylophones on the children's toy shelves of variety stores right up to weighted-keyboards designed to substitute for grand pianos.

The guitar has similar potential. Electronic emulation allows the venerable 6-string to play anything from campfire sing-along to stadium-rocking anthems through the headphones in a bedroom without the parents even being aware in the next room.

Music matured at the Millennium as an online medium. Midi files already had low bandwidth. Mp3 hosting became routine. Incorporation in video was given an artificial boost with the success of YouTube, despite it running at a loss like earlier video hosts (Betteridge, 2009) and dependence on advertising revenue to match storage costs. Much online music tuition was now being done through YouTube at the expense of immense bandwidth. The now-available lower bandwidth tools offered an alternative that might be able to emulate some of the features of personal music tutors. At the least, they ought to rival traditional book+CD music tuition methods.

Despite all this potential, the plummeted costs, and the space-savings, most people do not take up these instruments, much less 'play for life'. Even with a major assumption that large numbers had latent pitch and rhythm talent, one barrier might be ergonomic. However simple the instructions, not everyone can contort their fingers to do a supposedly-simple 3-finger 'power chord', much less a barre chord, much less an octave-stretch on a keyboard. Generations have been exhorted to practice long and hard to achieve these goals by stretch

exercises. In other areas human factors engineering had long started adapting the task to the learner. Could this be done with music?

The online system

A new 'instant learn' approach to music education (Benjamin, 2010) was developed and set up initially online in a self-instruction format. It was based on a human factors analysis of guitar playing. Simpler but 'jazzed' versions of chords could be produced with one or two fingers. Music scores were rewritten with software so that these simple one and two-fingered chord shapes would not discord with the backing tracks. There were many considerations:

- Fingering - could listenable music be created from the easiest 1-finger chords?
- Copyright – could sufficient original or public domain music be obtained?
- Bandwidth – could tiny midi files suffice to convey the music and tuition?
- Engagement – could copyright-free music, often 100 years old, engage today's learners?
- Scaffolding – if backing tracks glued the ensemble what would happen when pulled away?
- 'blind' Sound test – would the ensemble sound decent to an objective listener?

These were tested in a number of stages. The first was to create the system to a stage sufficient to test it. Chords were created on the guitar in a loose experimental fashion. Promising ones that sounded at least 'jazzy' rather than woefully discordant were then investigated with software. The chords were first recreated with 'chord-name finder' software from Gootar, which showed the many official names of these ersatz chords – ie- Because only one finger changed the chords shared many 'drone' strings which meant each might be a rough substitute for as many as five different chords. These official names were substituted for their nearest sounding chords in a known song in midi-creation software *Band in a Box* from PG Music. The resulting tables of chords were successively eliminated until a single 'scale' of these chords emerged –ie- these individual fret positions gave a roughly 'key of G' scale of chords. The official names of the sequence thus changed from G C E A B D to G69 Cmaj7 Em7 A7sus Bm11 D2 D11. The song played with the latter sequence clearly acquires a jazz quality because of the minor, 7th, maj7th, and suspended chords.

However, most songs were still recognizable and some barely seemed to change at all because melody, vocals and leads were unaffected by the changes to the rhythm instruments. The guitar chords were now simple to play but complex in sound –ie- a two-chord version of the folk song *Shady Grove* was created that relied on the open standard tuning to serve as a G69 chord and a single finger-press to create the Em7 chord. Thus, lifting a finger up and down was the only 'left-hand' motion required, allowing focus on the 'right-hand' strumming. The song was played by midi as G69 and Em7. A music therapist listening to the change when the backing track was added described it as 'magical'. The magic of course was because what had been an 'ugly duckling' chord now fitted in with the backing track using exactly those notes instead of what would have been a slightly different sound with the original chords.

There are of course limitations to this method. Highly complex songs can end up too distorted to be recognizable or listenable when such chords are substituted – jazz versions of classical symphonies have never caught on. But at the lower and middle end of the spectrum there are thousands of well-known songs whose chord sequences can be substituted with little damage. And, importantly, these are the pop songs that music beginners tend to like most. These backing tracks thus became the tools of the system. *Band in a Box* allowed midi tracks to quickly be created, transposed, and published in the hundreds to suit the needs of a learner for variety so as not be bored doing puerile or repetitive drills.

Road-testing the tools

A karaoke venue might seem an odd place to conduct research. Were it funded with a taxpayer grant it would be justifiably criticized from the pulpits of press and legislatures. But this was a non-budget voluntary Creative Commons project with public domain songs generated in a studio consisting of a laptop and microphone in a home lounge room. The only legitimate criticism might come from karaoke patrons who didn't like the tunes. But what better place to test a backing track? A typical karaoke host has 10,000 songs, some

being the original studio takes. It is a competitive market and junk versions get no repeat play. So performing a backing track at karaoke effectively pits it against thousands of studio-quality versions of the most popular backing tracks of all time, selected through the choices of generations of patrons.

Of course karaoke applause means nothing – it may as easily signify relief or consolation as admiration. What is far more objective and testable is recognition –ie- if listeners can tell the difference between these tracks and the commercial ones on the same nights. This allows for a number of controls. Holding the singer constant hence irrelevant, the backing tracks can vary between those with the original faithful chords and the ersatz versions created to the demands of the drone strings in the music-ed system. The results over many performances were encouraging. Hardly anyone noticed any difference between these and the commercial tracks. The karaoke host, regularly voted the nation's #1 host for a decade, who has heard thousands of performances, praised their quality and comparability. Thus encouraged, the system was published as Benjamin (2010) then posted to the web.

Field-testing the final project

The self-instruction toolkit was initially assembled and posted to the web consisting of

- A zipped PowerPoint with animated .gifs and midi file links to audio drills and examples
- A series of seventy-nine midi practise backing tracks covering different keys and styles
- An existing domain name www.oz-rock.com local slang for 'Australian rock'
- Vocal versions as mp3 versions on www.radio-tom.com to learn the songs

It soon became apparent from volunteers that nothing was going to happen with the above. Even those most enthusiastic, indeed who had encouraged its development in the first place, either lapsed back into conventional guitar tuition or just didn't bother. Some of the problem clearly remained the apparent complexity. Despite the system using catch-cries such as 'learn guitar in 10 minutes' and 'one-finger chords' these diagrams, even when animated, were not able to get the learner to the first stage. It didn't matter whether these were utter novices who had to be shown which hand holds the pick or accomplished musicians who were themselves teachers – this was clearly a new approach that had to be spelt out.

Hence, video versions became inescapable. However, this system differed from others in a significant way – this is a play-by-ear system. Thus, specific procedures such as 'watch my hands to finger this chord' could be kept to a minimum. Once a few chord shapes were shown the rest would be encouraged and expected as 'hunt & peck' improvisation around the fretboard, listening to which finger positions on the simple scale seemed to fit the music. A few examples on video ought to do the trick to get the learner started.

Even this failed to ignite. The YouTube phenomenon clearly shows what is needed for such a system to catch on: user-generated content. This was the lesson of Web 2.0 - If a critical mass of testers tried the method and posted example performances for comment this would generate a network. This has been the approach taken by publishers of 3D animation software such as Kahootz and Reallusion.

Lessons Learned and Future Directions

The main gains were in the numerator of the cost/benefit equation as predicted by Russell (1999) and Clark (1994): *"… there are a variety of treatments that will produce a desired learning goal. However, the utility of this knowledge is largely economic. The designer can and must choose the less expensive and most cognitively efficient way to represent and deliver instruction."*. Benefits are difficult to prove in education but costs are easy to quantify including the largest of these, production time. The project took far less time and effort than a book with comparable volume of material. A music video with multitrack vocals could go from inception to posting on Youtube in 4 hours. Indeed the entire website edifice of movies, multitrack songs, research, and guitar chord charts, was created from a coffee table laptop 'studio' with a podcast microphone and a supermarket guitar. The movie, music and PowerPoint hosting including domain names and top search engine placements cost less than $100/year. This is less than the registration cost of a conference paper to describe the research!

A low budget project like this does not need to change lives to justify its investment. It needs to carve a niche as an alternative instruction method. The current YouTube model of video hosting at a loss could change with either a new revenue model such as advertising or subscriptions or a technological leap that keeps costs low in the equation. This project differed from most low bandwidth solutions because these generally require more work –ie- it takes far longer to programme a tiny Flash .swf vector-animated audio-visual presentation than to point a camera at a guitar, play chords, and record a massive .avi file. This project at the least demonstrated that the materials can be created using common software without programming skills.

The main disappointment was the need to resort to video and even hands-on demonstrations. It is probably ambitious trying to use low-bandwidth media to impart a motor skill such as shooting a basketball or dancing. These never leant themselves to book learning. Guitar-playing, on the other hand, has a tradition of book learning. Indeed, many talented youth have picked it up spontaneously. We read of self-taught blues geniuses whose fathers built them guitars out of cigar boxes. Such outliers should not blind us to the original quest: most people do not engage in life-long musical learning. Whether this is due to the competing demands of parenthood when they grow up or the availability of broadcast music for passive listening matters little. What matters to this project is that even the motivated and otherwise-intelligent still require external motivators.

That, however, may yet be achievable online with low bandwidth and cost. This new music-ed system lends itself well to user-generated content. Popular songs are usually only around three minutes in length. The audio is the main focus so a low-resolution YouTube-posted performance can easily be compressed to a size that only marginally exceeds its audio component alone. This ought to be a saving grace to schools or community groups in that they can see finite limits to time spent on an extracurricular musical project and to the cost demands for more technology.

Thus the ultimate tests are yet to come. Education in general has to contend with questions of outcomes years down the track. Music education as a mostly recreational activity comes under less scrutiny. The outcome is usually seen in immediate enjoyment rather than achieving academic objectives. Fads and even failures make popular YouTube entertainment. Rather, user-shows generate empathy and competitive urges that can motivate all through the learning cycle. Importantly, they alone can create the fad or buzz that makes this a desirable activity. Young learners unfamiliar with copyright would understandably question why 100-year old songs would be used in place of what they hear on the air. But the music cycle is replete with resurrections becoming crazes such as the Hootenanny and Skiffle revivals of the 50s-60s. A circularity is predictable such that the simple songs can become popular if and because opinion leaders say they are popular. The Cognitive Dissonance research of the 60s showed that there are many compensatory mechanisms that save face for learners doing something superficially odd like playing 100-year old spiritual songs on guitar when their known tastes run to heavy metal. The next logical step for the project is to make it into yet another home music fad.

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