

Reflective conservatoire conference

Promoting collaborative playful experimentation through group ear playing in Higher Education

Abstract

Forty-six first-year, primarily classically trained, undergraduate students took part in an exploratory research study on Group Ear Playing (GEP) in Higher Education. The students attended the 'Playing by Ear' component of the Practical Musicianship module, which adopts the materials and strategies on playing by ear in the instrumental lesson developed by Lucy Green (2012; 2014). The students were divided into eight groups, they were provided with audio material (one pop song, a selection of classical pieces from which to select one and a free choice piece) and were instructed to copy the music by ear as a group for 40 minutes each week for five weeks. Data were collected through individual reflective logs collected each week (n=196) and end-of-programme feedback forms that included open questions and rating scales.

The findings of the study suggest firstly, that the students engaged in playful experimentation in a collaborative manner, where the more confident musicians supported their less confident colleagues. Secondly, a variety of strategies for improvising together was explored, which included adding ornaments based on scales, playing chords and rhythms for variety, altering the pieces' structure, adding or changing rhythms, and missing notes out. Thirdly, although the focus of the activity was on copying music by ear from recordings, all groups included an improvisation section at each piece they rehearsed, where all musicians playfully experimented together rather than as soloists, in order to 'change things slightly' and 'make the piece sound more interesting'. Finally, the students reported that GEP not only helped them to feel more confident about playing by ear (85%) but also to be more confident about improvising (72%) and to become more confident musicians (78%).

This study proposes that group ear playing from recordings successfully facilitates collaborative playful experimentation and motivates apprehensive classically trained musicians in Higher Education contexts to become '*less self-conscious*' and '*enjoy new ways of improvising*'.

Keywords

Group Ear Playing; improvisation strategies; collaborative experimentation; higher education

Background

Group playing has been found to motivate learners to practise, with direct links to increased achievement. Furthermore, it creates a sense of belonging and of making an active contribution to a group, it supports the creation of friendships, it boosts the participants' social skills, it supports teamwork skills, self-discipline and concentration, a sense of responsibility towards shared goals and purpose of the group; a sense of achievement and the development of a musical identity.

There are particular musical skills such as improvising and playing by ear that flourish as a result of collective experimentation and interaction within a music group (Green, 2001; Johnston, 2013). In her book *How popular musicians learn* (2001) Green emphasised that popular musicians acquire musical skills and knowledge through copying recordings by ear and through peer learning and collaborative experimentation. Johnston (2013) and Thomson (2008) highlight that improvisation skills can be ideally nurtured through collaborative learning and group relationships and interactions where students are free to collectively experiment together.

James Mainwaring (1951a, 1951b) and Phillip Priest (1985, 1989) stressed that ear playing supports the development of musical literacy and creative musicianship. Experimental research with 101 high school instrumentalists by McPherson (1995) and McPherson et al. (1997) has also shown that playing by ear was the only attribute that correlated with the other four attributes examined (improvising, performing rehearsed music, playing from memory and sight-reading), suggesting its significance in supporting their development.

With the exception of Woody and Lehmann's study (2010) on the differences in ear playing ability between formal classically-trained musicians and those with vernacular music experience, no other study has systematically studied ear playing as skill to be developed within Higher Education. Woody and Lehmann's study found that the vernacular musicians outperformed the formal musicians on singing back and playing back on instruments. A strong association emerged between musicians' performance and the ear playing tasks and their prior experiences. Vernacular musicians played songs from recordings, played chord progressions on the piano, collaborated in

groups to work up a song, improvised and composed music, 'messed around', improvised in a group, improvised solos to recorded accompaniments and composed original music. Formal musicians, on the contrary, had limited or non-existent prior experiences of such creative musical activities during their musical development. The authors concluded that playing by ear is largely absent from music education curricula, both in one-to-one instrumental settings and in group settings.

The study described here explored how engagement in a short Group Ear Playing (GEP) programme, supported first year undergraduate students' creativity and improvisation skills and the processes that they adopted in order to practise familiar and unfamiliar musical repertoire through collaborative playful experimentation.

The sample

Forty-six students took part in a 5-week Ear Playing segment of a HE Practical Musicianship module. The students were randomly allocated in eight groups of maximum six or seven students with at least one pianist in each group. The students were given the freedom to choose between their principal instrument or their second or other instruments. The instruments that were played by the students were: violin, cello, double bass, flute, clarinet, oboe, trumpet, saxophone, piano, marimba, xylophone, glockenspiel, acoustic guitar, electric guitar, bass, recorder and euphonium. The majority (28/46, 61%) chose their principal instrument and the singers (14/46, 30%) played the piano, xylophone, glockenspiel or their second instrument. All students had a Grade 8 or equivalent in their principal instrument and Grade 5 theory, which are pre-requisites for entrance to the Music Department where the study took place. This ensured a level of consistency in musicianship (technical competence and music theory) across the sample.

Procedure of GEP and data collection

Each group engaged in GEP for five weeks. On their first session each group was allocated a spacious room with an electric piano and the participants were asked to copy musical material provided to them by ear as a group. It was clarified by the tutor that the students were free to make any changes they wished to the pieces copied, for example changes in the dynamics, tempo,

rhythm, harmony and even the melody, as long as they kept the flow of the music. It was stressed that seeking perfection was not the focus of the activity. Instead, playful interactions amongst the musicians and opportunities for creating new material were welcome. The tutor would then leave the room and return forty minutes later to informally record the students' piece at the end of each week's session. Informal recordings at the end of each session were taken so that each group could track their progress over the five weeks of the programme.

Before the end of each session the tutor distributed a reflective log with the question '*Can you describe how you went about copying music by ear from a recording during the session?*' to each student. The reflective logs were collected on the day or were sent to the tutor by email before the following session. The logs were identified as a useful documental form of collecting detailed descriptions of individual and GEP improvisation processes.

The GEP study used the same audio material for the first two stages of the programme (*Link Up* and a selection of 6 classical pieces) as Green (2012a; 2012b) and Varvarigou & Green (2014), which can also be found in the book 'Hear, Listen, Play' (Green, 2014). The material was uploaded on Blackboard, the university's Virtual Learning Environment, and all students had access to the material. For the first two stages of the programme (weeks one to three) the students were asked to copy *Link Up* and one of six classical pieces by ear. For the third stage of the programme each group could select a piece of their choice and, by following the same approach as in stages one and two, copy it by ear.

At the end of the programme each student filled in a short feedback form that sought their level of agreement (1 strongly disagree to 5 strongly agree) with a list of statements: 1) whether they had done ear playing similar to the Playing by Ear classes before; whether Playing by Ear classes 2) helped them feel more confident about playing by ear; 3) helped them become more confident musicians; 4) helped them feel more confident about improvising; 5) improved their musical skills, in general; 6) information was communicated clearly; 7) the sessions were at the right level for them. They were also asked to respond to the open questions 'I most enjoyed...', 'I least enjoyed...' and 'Overall, what if anything (musical or other skills), do you think you might have learnt from doing the ear-playing task'. Space was also available for the students to add any comments they had about this particular unit within the Practical Musicianship module. Finally, four

students (two males and two females) were interviewed at the end of the academic year after they completed the module. Three out of the four students selected received high marks for GEP but had reported in their forms that they had never engaged in group ear playing before. The fourth student was selected because she indicated in her logs and feedback forms that she found the programme 'out of her comfort zone' and non-enjoyable. All interviews were audio-recorded and transcribed verbatim for analysis.

Methods

The analysis of the data focused on thematic discovery from the transcripts and was achieved through open, axial and selective coding (Creswell, 2007). During open coding categories were identified by a constant examination of the transcripts (236 sources, including 194 individual reflective logs, 36 feedback forms and 4 interview transcripts) and by repeated comparisons. Open coding was followed by axial coding, where blocks of categories grouped together to describe core phenomena related to GEP in HE. Lastly, selective coding allowed for key concepts that were closely entwined to emerge and validate the interrelationship of categories in the analysis. This process of analysis allowed the researcher to shift concepts around until relations of the categories with each other and with the collective dataset were achieved.

Role of the tutor/ researcher

The tutor/ researcher facilitated the module. This included organising the groups, providing the audio material (for stages 1 and 2 of the programme), and recording the student groups at the end of each session. Instead of standing back and observing the students engage in the task, the tutor/ researcher gave absolute autonomy to the students by leaving the room as she wished to avoid exerting control over the use of the recorded music and to avoid engaging in discussion with the students at the expense of playful collective experimentation. During the first couple of weeks the tutor/ researcher occasionally visited the groups to check that they faced no technical or other issues but she was strongly encouraged to leave and return at the time that was set for the recording of the informal performances.

Findings

The Process of Group Ear Playing

To begin with, students' responses to the module feedback form indicated that 43% (20/46) of the students had not engaged in GEP before – as opposed to 31% (14/46) who had and 26% (12/46) who did not respond. The analysis of the reflective logs and the interviews offered an interesting insight into the approaches adopted for learning a new piece by ear. Most groups listened to the pieces and allocated the different parts according to what they thought was the appropriate instrument (See Table 1). Then, each individual used various strategies to find the first note of the melodies in focus through playing random notes; playing a scale; focusing on the rhythm first, 'guessing' the first note; playing pitch and rhythm together; and singing a scale to find the first note. This was followed by making decisions as a group about the structure of the piece: introduction, ending and improvisation section. Few groups did not allocate parts from the beginning but, instead, they learnt each part and then decided on which part to play. The groups continued by listening to the recording several times and by playing along in order to build up the piece. Some students tried to harmonise to the melodies played by their colleagues and some made a practice plan before the next session. Other approaches included playing without the recording, working out the key and two students wrote down the notes of the pieces played.

Table 1: Approaches to learning a new piece as a group

	Sources	References
Learning a new piece	41	175
Listened to CD and allocated parts according to appropriate instrument	24	40
Finding the first note or emphasis on rhythm	21	39
· <i>Played a scale to find right note</i>	9	11
· <i>Playing random notes</i>	8	12
· <i>Rhythm first then notes</i>	6	7
· <i>'Guessed' the first note</i>	3	4
· <i>Pitch and rhythm together</i>	3	4
· <i>Sang upwards a scale to find the notes</i>	1	1
Deciding on structure, improvisation, intro and ending	17	25
Listened to CD and went through/ learnt each part	13	19
Playing along with the recording	13	17
Personal practice	8	9
Tried to harmonise	8	8
Played without the recording	6	6
Working out the key	5	6
Writing down the notes	2	3

Playful experimentation with new repertoire

Whilst learning the new melodies and when rehearsing them in the group the individuals engaged in playful experimentation with a variety of repertoire and they reported developing a wealth of musical skills through this experience (See Table 2). The students found the pop-funk piece of stage 1 (*Link Up*) repetitive and easy, and a good piece to start with. The classical melodies and bass lines provided for stage 2 were identified by the students as challenging to learn by ear: the long phrases were difficult to remember, the disjunct intervals of Bach's Anna Magdalena Minuet 3 melody created complex harmonies, Mozart's *Eine Kleine Nachtmusik* was described as 'tricky' and the theme from Brahms' symphony no 1, mvt 4 'too tricky'. In relation to challenges presented by the repertoire, some students reported the following:

- *'This week we did the Mozart piece and it was a lot more challenging due to more texture. I mainly took the tune with Zoe. It took a while to work out the notes but turned out fine, we made it our own with a little intro and recap at the end' (Jonathan, Log 2)*
- *'I would probably say, and this is personal taste, I am not too keen on the classical [stage]. I found that trickier than other play by ear things because Mozart is nuts! What he was sort of doing was much trickier because there was a lot of notes and it changed all the time...it is almost through-composed but the ideas are so fast and technical that it became really difficult to play' (Lucas, interview)*

The third stage of the programme included a piece of the group's free choice. This appealed to the students who chose popular songs (*Bad Romance* by Lady Gaga; *Pompeii* by Bastille), film music (*Concerning Hobbits* by the Lord of the Rings; *I am the Doctor Who*) and *Summertime* by George Gershwin. Students' comments indicated that creativity and experimentation were included in the selection of repertoire as much as the performance of the piece and musical decisions about structure and improvisation. An example is offered below:

- *'In this third sessions we chose a piece of our choice. After some deliberation we chose Lady Gaga's 'Bad Romance'. We researched pop songs in C major to make things easier for the xylophones and this song was popular with everyone'. (Joshua, Log 3)*

Table 2: Playful experimentation with repertoire and skills acquired through this process

Playful experimentation	Sources	References
Repertoire	34	71
• <i>Classical pieces</i>	23	35
• <i>Free choice pieces</i>	12	20
• <i>Link Up</i>	8	10
• <i>Repertoire appreciation</i>	5	6
Learnt listening skills	16	20
Learnt to play a new instrument	7	15
Learnt to harmonise melodies and to listen for harmony	7	9
Gained knowledge of my instrument	6	6
Ear playing develops creativity	2	3

The experimentation with self-selected or given repertoire reportedly supported students development of ear playing skills, their listening skills, it gave some learners the opportunity to play a new instrument, to learn how to harmonise melodies and to listen for harmony; it helped some others 'gain knowledge of [their] instrument', to develop creativity and repertoire appreciation.

- *'It has been really helpful to get some more dynamic...to combine classical music and contemporary repertoire...I did play on the cello some of the violin parts and I was able to identify the melody and to recreate it quite well. I think that being a string player has developed my pitch...I really enjoyed this session...I think it helps us develop our musical creativity' (Heather, interview).*
- *'I most enjoyed exploring different styles and genres' (Leo, Log 5)*
- *'I most enjoyed developing my glockenspiel skills' (Alex, Log 5)*
- *'I have learnt how to play by ear and create chords around initial notes heard. I have also learnt how to improvise' (Nina, Log 5)*

Collaboration and collective experimentation – benefits and challenges

The students who faced difficulties in working out the pieces on their own received substantial support from their colleagues, as highlighted by a wealth of students' comments on 'collaborative learning' (see Table 3). Likewise, a plethora of comments indicated that collective experimentation during GEP helped the participants experience the feel of creating 'new' music together. It also helped them develop ear playing skills and social skills such as leading, following, communicating and 'giving away' in group music making. Some of the comments in relation to how participants learnt to work well with others include the following:

- *'Really good idea for a module. Allows great teamwork to take place with good quality musical results'. (Alex - xylophone)*
- *'I really enjoyed the ear training and it did not only improve my skill of playing by ear but also listening to others and being aware of others in the group'. (Phillipa – marimba)*
- *'I also learnt how to help, encourage and co-direct an ensemble of various experiences/ instruments'. (Joshua - electric guitar)*

Table 3: Benefits and challenges from collaboration and collective experimentation

	Sources	References
Collaborative learning	31	54
• <i>Making 'new' music as a group</i>	18	20
• <i>Group work on harder parts</i>	13	18
• <i>Fellow performers helped me</i>	7	9
• <i>Teaching another performer</i>	7	7
Learning to play by ear without much trouble	26	35
• <i>Learnt to play by ear in a group</i>	14	17
• <i>Group ear playing felt comfortable</i>	4	4
Working with other people well	24	33
GEP challenges	11	15
• <i>Least enjoyed to get the group to focus</i>	7	9
• <i>Least enjoyed a self-conscious feeling</i>	5	5
• <i>Different instruments difficult to put together</i>	1	1
Recording each group made people work	2	2
Joined other bands/ busking	1	1

Lewis was a competent pianist with particular interest in jazz who regularly supported members of his group. He explained that close collaboration and practising '*helped working out the pieces as a group rather than individually because it meant that we could help each other out on areas we were struggling with*'. The salience of practising as a group was echoed, amongst others

by Elliot, a guitar player who added that his final stage of learning a new piece was to '*understand how [his] part fitted in with everyone else, which was accomplished by practising as a group*'.

GEP did not come without challenges. Five students reported that they least enjoyed the '*feeling of being self-conscious*', whereas seven students mentioned '*trying to get the group to focus*' and making sure that everyone was '*on the same page*'. In particular, Lucas, a bass player, explained that '*making sure that everyone was on the same page more than learning the notes... getting it so it was all together in the right place*' was a real challenge. This was echoed by Heather, his cellist group mate, who added that she was conscious about '*trying to explain what you want from them but then allow them to be natural as well*'. Dylan, a euphonium player, recognised that '*the different instruments [were] different to put together due to the varying pitches and tones*'.

Finally, Megan reported an overall discomfort with ear playing. The absence of written music in combination with the fact that she could not use her voice (her principal instrument) '*knocked [her] confidence*'. This made her withdraw from actively engaging in collaborative exploration; instead she reported enjoying listening to her group members' explorations. Nonetheless, during her interview, Megan emphasised very strongly that ear playing is '*important for general musicianship*' and that it should start early in one's musical learning.

Improvisation

As the groups became comfortable with the music which was learnt by ear, the members reported moving quickly into '*playing with music*' within a group. The individual strategies for improvisation adopted by the students included '*adding ornaments based on scales*', '*changing the rhythm*', '*incorporating other melodies*' and '*missing notes out*' (See Table 4). Listening to each other was a key mediator to improvising. Listening was acknowledged as a core skill developed during participation in GEP.

Group improvisation was instigated by the group members in order to '*make the pieces sound more interesting*' and it was achieved by '*altering the pieces' structure*' and '*improvising through harmonising/ fitting with others' parts*' (see Table 4). Lucy, described in her second log

how the group initiated experimentation that led to improvisation and switching around different melodic lines amongst the group members on the second week of GEP.

'Following on from last week's session, we continued with the same structure as we used before (round style and improvisation section) but this time experimented with each others different parts by switching them round on our different instruments. It was interesting to listen to the piece of music performed in this new way, and how a melody played on one instrument can give a completely different feel to the music, when played on another instrument. It was also interesting to hear everyone's new improvised section, which differed from last weeks session, and to hear it swapped round on our various instruments.'

Table 4: Group and individual improvisation strategies

	Sources	References
Individual improvisation strategies	15	25
· Adding ornaments based on scales	8	11
· Changing the rhythm for variety	6	7
· Incorporating other melodic riffs	3	3
· Missed notes out	2	2
· Experimenting by changing the key	1	1
Group Improvisation strategies	14	26
· Improvised to make piece sound more interesting	7	9
· Improvising by altering the piece structure	6	8
· Improvising through harmonising/ fitting with others parts	3	6
· Improvised as became comfortable with the music	3	3

Freya, reported on the third week of GEP that group interaction and playful experimentation, where the group decided that *'it [her melody] sounded good'* although it was *'quite dissonant'*, increased her confidence as her improvisation skills developed.

'This week was a re-learning process for my tune as a reminder. We then tried the given structure but when I played my part with the bass and piano it seemed to be quite dissonant and to not fit together but we decided that it sounded good that way. We then did our own structure and went onto improvising. My improvising got better as the time and my confidence went on and by the end I was much more fluent and improvising singly and also with fitting with the other members of our group.'

On the fourth week of GEP and after quite a lot of experimentation with improvisation, listening, and *'thinking about the pieces'* the groups kept developing new arrangements in their quest for making the pieces *'more interesting'*. Freya wrote

'This week we went back over the Link Up tune and found it a lot easier to improvise with confidence though I now know to know what key you are in before improvising otherwise it goes wrong but I did find the key after two very bad B \sharp rather than B \flat when going over the classical tune I only needed two plays through reminders to remember my tune and then the improvising came more easily. We haven't so far done the same arrangement which is good because it means we can have lots of variations when it comes to performing.'

GEP was very well received by the students despite the challenges that emerged from group dynamics and from playing in *'unconventional ensembles'*. *'Learned to play by ear in a group'* was the most prevalent skill that the students reported to have acquired from the programme (See Table 5). Students highlighted that playing by ear in a group felt comfortable and could not have been introduced in a better way other than a group setting. Other popular responses on the benefits from GEP included *'learning to work with other people well'*, which supported the students' leadership and cooperation skills through *'taking others' opinions'*. Moreover, students contended that through GEP they *'learned listening skills'* and they treasured the opportunity to *'learn to play a new instrument'*.

Overall, responses from the module feedback form indicated that GEP helped the students develop strategies on how to learn to play by ear; it made them more confident about improvising and more confident musicians. 85% (39/46) agreed or strongly agreed that through GEP they became more confident about playing by ear and 78% (36/46) that they became more confident musicians; 78% (36/46) reported that the programme was at the right level for them; 80% (37/46) reported that the programme improved their musical skills in general; and 72% (33/46) acknowledged that the programme has helped them to be more confident about improvising. Some of the comments they offered in their feedback form are presented below.

- *'I learnt to improvise in a more classical style, which put me out of my comfort zone but has also helped me get a better understanding of certain classical structures' (Max – piano)*

- *'I feel confident that I have made progress, and will eventually be able to cement the notes in place, allowing me to improvise around the tunes.'* (June– trumpet)
- *'I think it helped with my improvisation skills, regarding improvising on a piece already learnt. I also think it helped me to be able to identify the chords within a piece.'* (Dylan– euphonium)
- *'Improvising is less scary than I have found it previously, which is a relief, and it is more fun. Though I do find that I don't necessary remember my previous improvisation so it's all a bit different each time. I would recommend this type of practice to everyone – no matter ability or confident level.'* (Miriam – violin)

Conclusions

The participants in this study on GEP in HE strongly emphasised through their weekly reflective logs that engagement in GEP facilitated playful experimentation through an exploration of varied repertoire, which was either provided by the tutor or selected by the students. Choosing repertoire as a group made the participants collaborate and develop social and communication skills necessary in any group music-making context (Hallam & Gaunt, 2012). It also helped them develop their creativity by focusing their attention on rehearsing and learning together the pieces they chose. A good example of group creativity was Lucy's account of her playing *'dissonant music'* that did not appear to *'fit together'*; yet the group decided that *'it sounded good that way'*.

During playful experimentation with the repertoire the students reported developing their listening skills. Their playfulness was also extended to picking up an instrument that they had not played before such as the xylophone or the glockenspiel, or their second instrument or an instrument that they liked, such as the recorder or the melodica. Furthermore, some students highlighted that GEP helped them to learn to harmonise and to listen for harmony and some acknowledged that this playful experimentation helped them to gain further knowledge of their first instrument.

It has been suggested by the students that the repertoire, which acted as a scaffold, their aspiration to *'make the piece sound more interesting'* and their collective interactions led them to make rhythmic and melodic embellishments, miss notes out, change the harmony in order to *'fit*

with others' parts'; and they engaged in improvisation in a natural and gentle way. GEP, through playful experimentation, helped the students develop a knowledge base of the creative processes required during improvisation, which were not necessarily idiomatic to a particular genre. This, if further pursued, could make them flexible and rounded musicians (Johansson, 2004; Johnston, 2013).

Ear playing and improvisation in bands or other instrumental ensembles is either presented as an 'option or, worse yet, an odious exercise' (Woody & Lehmann, 2010, p. 113) but the approach developed by Green (2014) offers a promising starting point in nurturing and encouraging these musical skills, which not only support the development of musicianship but also the enjoyment of group music making which could last learners for a lifetime.

References

- Creswell, J. (2007). *Qualitative Inquiry & research Design - Choosing among five approaches* (Second ed.). Thousand Oaks: Sage Publications.
- Green, L. (2001). *How popular musicians learn*. Aldershot: Ashgate Publishers.
- Green, L. (2006). Popular music education in and for itself, and for 'other' music: current research in the classroom. *International Journal of Music Education*, 24(2), 101-118.
- Green, L. (2008). *Music, informal learning and the school: A new classroom pedagogy*. Aldershot: Ashgate Publishers.
- Green, L. (2012a). Informal learning and aural learning in the instrumental music lesson: a research-and-development pilot project. In L. Vakeva & S. Karlsen (Eds.), *Future prospects for music education: Corroborating informal learning pedagogy* (pp. 161 - 196). Cambridge: Cambridge Scholars Press.
- Green, L. (2012b). Musical 'learning styles' and 'learning strategies' in the instrumental lesson: Some emergent findings from a pilot study. *Psychology of Music*, 40(1), 42-65. doi: 10.1177/035735610385510
- Green, L. (2014). *Hear, Listen, Play! How to free your students' aural, improvisation and performance abilities*. Oxford: Oxford University Press.

- Hallam, S., & Gaunt, H. (2012). *Preparing for success - a practical guide for young musicians*. London: Institute of Education.
- Johansson, K. (2004). What chord was that? A study of strategies among ear players in rock music. *Research studies in Music Education*, 23(1), 94-101.
- Johnston, P. (2013). Teaching improvisation and the pedagogical history of the Jimmy Giuffre 3. *International Journal of Music Education*, 31(4), 383-393.
- Mainwaring, J. (1951a). Psychological factors in the teaching of music: Part 1: Conceptual musicianship. *British Journal of Educational Psychology*, 21(2), 105-121.
- Mainwaring, J. (1951b). Psychological factors in the teaching of music: Part II: Applied musicianship. *British Journal of Educational Psychology*, 21(3), 199-213.
- McPherson, G. (1995). Five aspects of musical performance and their correlates. *Bulletin of the Council for Research in Music Education*, 127(Winter), 115-121.
- McPherson, G., Bailey, M., & Sinclair, K. (1997). Path analysis of a theoretical model to describe the relationship among five types of musical performance. *Journal of research in music education*, 45(1), 103-129.
- Priest, P. (1985). Playing by Ear. *Music Teacher*, 64(3), 10-11.
- Priest, P. (1989). Playing by Ear: its Nature and Application to Instrumental learning. *British Journal of Music Education*, 6(2), 173-191.
- Thomson, S. (2008). The pedagogical imperative of musical improvisation. *Critical studies in improvisation*, 3(2), 1-12.
- Varvarigou, M., & Green, L. (2014). Musical 'learning styles' and 'learning strategies' in the instrumental lesson: main-study findings. *Psychology of Music*, doi: 10.1177/0305735614535460.
- Woody, R. H., & Lehmann, A. C. (2010). Student musicians' ear playing ability as a function of vernacular music experience. *Journal of research in music education*, 58(2), 101 - 115.