

# Adopting a musical intelligence and e-Learning approach to improve the English language pronunciation of Chinese students

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**Abstract** This study investigates the use of musical intelligence to improve the English pronunciation of Chinese third level students. It is relevant for a human-centred systems engineering approach to cross-cultural interaction. Language learning is important as valid communication can help interactions and cultural understanding between countries, this also may benefit international stability. There are natural barriers between the English and Chinese language which are reflected in teaching approaches. The teaching of English in Chinese classrooms is removed from real-world English learning environments. The academic environments and approaches focus on the learning of grammar, spelling and writing with little real-life conversation and interaction with native English speakers. English language learning in China is from a more academic perspective rather than practical utilisation. Correct pronunciation and accent is therefore diminished. This study demonstrates that a musical intelligence e-Learning approach can benefit Chinese English language students.

**Keywords** Multiple intelligence · Musical intelligence · English language pronunciation · e-Learning · International stability · Cross-cultural interaction

## 1 Introduction

The current English learning situation in China continues to be affected by many problems often linked to traditional

teaching approaches and learning environments. The natural barriers to English language acquisition and its differences to the Chinese language are many and varied. English is a stressed and rhythmic language, and Chinese is predominantly a tonal one. Several provincial and regional accents compound these differences giving rise to a variety of problems. The researcher's personal experiences and observations combined with a review of the literature highlights the position that Chinese English language students suffer serious limitations on learning methods and environments. The literature also suggests that e-Learning and a musical intelligence approach can provide solutions to these problems.

Gardner's (1983) Multiple intelligences can be used for learning and teaching. Musical intelligence also has parallel structures with language (Gardner 1983; Stokes 2008). The convenience of time and distance of an e-Learning approach is important for learners. All of these elements suggest that the adoption of a musical intelligence e-Learning approach may benefit the pronunciation and accent of Chinese third level students. In order to assess the research questions, the researcher developed a combined musical multimedia teaching session and used a case study methodology to assess the multimedia teaching session of a sample group. This group was compared with a control group to test whether a musical intelligence e-Learning approach had improved students' learning outcomes.

## 2 Background and approach

### 2.1 Basis for research

The background of this research is based on the natural barriers between Chinese and English languages

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(Shoebottom 2011), non-native language learning environments and invalid teaching approaches. Some of the issues are caused by China's economic and cultural situation. There are few native English language teachers who cannot meet the needs of a large population. This worsens when you consider the large geographic regions and widespread population in China. As a result, most English teachers in China are Chinese, and the large class numbers cause English learning to be a classroom environment and not real-world learning (Wang 2007). The theory of multiple intelligence from Gardner (1983) presents people with a new learning scenario. Gardner, especially, suggests that musical intelligence shares a parallel structure with linguistic intelligence. Stokes (2008) proposes that music can be a valid approach to language learning. A combined musical intelligence and e-Learning approach overcomes the limitation on time and location and improves the English language learning situation in China. All of those points are addressed in this research study.

## 2.2 Musical methods description

Stokes (2008) suggests using English songs to teach students language may encourage the adoption of native speech patterns. For example, the study of speech and rhythms, prosody, promotes the notion that proper English language acquisition and pronunciation necessitates that some words 'receive accents as part of regular pronunciation'. Students may learn the correct placement of stress and accents on syllables and words through the use of rhymes, chants and song while also improving the pace and cadence of the subject language. This study used a high- or low-pitch musical note recording and playback to emphasise any stressed or non-stressed syllable. The duration, timing and pace required for each word was also presented to the case study musical intelligence group utilising this method.

Frith (1985) claims that there are 3 stages used for children learning to read; (1) be familiar with words visually, (2) combining the words' visual part ('graphemes') and pronunciation (phonemes), (3) Children can 'sound-out' syllables and words when they are learning to read. Firth proposed that music can improve the 'phonemic' stage to help reading (Salcedo 2010). Thus, if students use similar stages when learning to read a foreign language, music may help with the 'sound-symbol phonemic correspondence' for language learning (Salcedo 2010). The approach was adapted for this study where a phoneme musical style system was adopted to promote proper acquisition of pronunciation and accent. Essentially, the study's approach was one of a repeated cycle of *Read Text–Listen Native Speaker–Listen Musical Note* with an opportunity to practice between each cycle.

Butzlaff (2000) reinforces the argument that reading expertise involves 'sensitivity to phonological distinctions',

and music listening expertise entails a 'sensitivity to tonal distinctions', utilised in this study by linking stressed syllables and musical notes. The researcher distinguished and assigned different musical notes to specific syllables and then applied to each selected word (words commonly mispronounced by Chinese students), the native pronunciation of those selected words were also recorded. Those voice and music recordings were embedded into SWF files and presented to the subjects via HTML web pages and then used in the case study, pre-test and post-test, to collect data (see Sect. 7). The audio/musical/textual presentation was further enhanced by also presenting each word in International Phonetic Alphabet (IPA) format, incorporating a spoken and auditory approach which Logsdon (2010) suggests works well when teaching students with musical intelligence.

## 3 Objectives

The literature review generates the research question for this study as follows:

**Does the adoption of musical intelligence in an e-Learning environment benefit Chinese third level English language students' pronunciation and accent?**

More detailed examination of the literature suggests the following three hypotheses:

1. Musical intelligence is a valid approach to teach English to Chinese students with different intelligences.
2. A music and e-Learning approach improves the pronunciation and accent of Chinese English language students with music intelligence.
3. Musical intelligence has a positive perception amongst English language teachers and Chinese English language students.

## 4 Target group

Eleven Chinese English language students in the Bridging Course in Waterford Institute of Technology (WIT) attended a case study. Five of them in the control group with a traditional pronunciation learning approach, another six students in the focus group using the musical intelligence e-Learning approach. An online questionnaire was also sent to 51 Chinese English language students and teachers in China.

## 5 Teaching English language pronunciation

### 5.1 English language is important to Chinese students

The majority of Chinese people consider English as a global language and believe mastering the English

language can create more opportunities for their career and social life (Yeh 2005). Most students learn English to prepare for special foreign exams, such as Graduate Record Examination (GRE), Test of English as a Foreign Language (TOEFL) and International English Language Testing System (IELTS), which may provide a chance for them to study abroad or work at an international company. These learners include children, older people and some with an interest in English (Yeh 2005).

## 5.2 Issues with English pronunciation

After many years of traditional language English teaching methods, many third level Chinese students still have poor spoken English, experiencing problems with communicating in English because of difficulties with pronunciation and accent (Wang 2007). Problems with pronunciation and intonation give heavy regional Chinese accents to English although the grammar may be perfect. The result is poorly understood spoken English (Shoebottom 2011).

Because of the huge population of English learners in China and the limitation on native learning environments, differences between Chinese character and English character pronunciation, the high cost of native English speaking teachers' classes, a new, valid and inexpensive way to improve English language pronunciation for Chinese students is required.

English and Chinese have many important differences as they belong to two different language families. These differences suggest Shoebottom (2011) include:

*Alphabet* Chinese written language uses a logographic system. However, English uses an alphabet system. In Chinese, symbols are the words themselves, in English, a word is made-up of various letters. This basic difference creates serious difficulties when Chinese students learn to read and spell English words.

*Phonology* Chinese English language students have difficulties with the English phonological system. The Chinese language does not contain some English phonemes, 'the units of sound in a specified language that distinguish one word from another' (The Concise Oxford Dictionary 1991), stress and intonation patterns are also different in the two languages. Chinese is a tone language and the changes in pitch (highness or lowness) of a phoneme sound will also change word meaning. English uses the changes in pitch to stress or express emotion. English has more vowel sounds (a, e, i, o, u, sometimes includes y) than Chinese and this causes some incorrect pronunciation for Chinese English language students, for example, *ship/sheep*, *it/teat*, *full/fool*. Chinese English language students have difficulties to distinguish *l* and *r* and so may mispronounce *rake* and *rice* as *lake* and *lice*. Southern Chinese speakers have a similar difficulty in distinguishing *l* and

*n*. The common final consonant (not vowel letters) in English may also cause mispronunciation by Chinese students. For example, *hill* may be pronounced as without the double *ll*.

Some English words are pronounced incorrectly as the spelling suggests some mispronunciation. For example, the word WEDNESDAY is pronounced as 'Wensday', and not 'WED-nes-day'. The first 'd' should be silent (Eufrocina and Paulcoto 2008).

## 5.3 Traditional spoken English teaching methods in China

In China, Chinese students learn a classroom English rather than a real-word English (Zhao 2010). The culture within the Chinese classroom does not promote interaction and reduces the opportunities to practice spoken English (Zhao 2010). The process is teacher centric with both student and teacher overreliance on textbooks (Brick 2004) and with students learning English accent and pronunciation through the IPA Transcription. This process is behaviouristic and often time-consuming and boring (Wang 2007). Some of the traditional pronunciation approaches and issues in China (Zhao 2010; Wang 2007) include as follows:

1. Learning from textbooks using traditional pronunciation methods IPA.
2. Constantly repeating a word till the pronunciation of the word is memorised.
3. Chinese students are normally taught by a Chinese lecturer who has a Chinese accented English pronunciation.
4. Chinese students' English accent is a regional Chinese English accent.

## 6 Multiple intelligence, musical intelligence and language learning

### 6.1 Multiple intelligence

Gardner (1983) suggests that different intelligences may each be used as a method of delivering, or as an academic entry point to all kinds of subjects. The theory of multiple intelligence (Gardner 1983, 2000) includes as follows:

1. Linguistic—sensitive to sounds, meaning of words and language
2. Logical-mathematical intelligence—capacity to analyse problems logically and handle mathematical operations
3. Musical intelligence—the abilities to understand appreciate and produce rhythm, pitch and timbre
4. Bodily kinaesthetic intelligence—the abilities of using body or body parts to solve problems or make products skilfully

5. Spatial intelligence—capacities to understand and change patterns and space, useful for map making, artistic, and planning creativity
6. Interpersonal intelligence—the capacity to understand other peoples' destination, motivation and desires and to work with people effectively
7. Intrapersonal intelligence—the capacity of understanding one's own feelings and using this information to instruct behaviour

## 6.2 Musical intelligence

On mentioning musical intelligence, we should understand that it includes 'performance, composition and appreciation of musical patterns' (Smith 2002). Gardner defines musical intelligence as 'an ability to produce and appreciate rhythm, pitch and timbre or appreciation of the forms of musical expressiveness' (Mills 2001).

## 6.3 Musical intelligence with language learning

Gardner (1983) suggests that musical intelligence shares a parallel structure with linguistic intelligence. Stokes (2008) proposed that music can be a valid method for language learning. Sloboda (1990) compared and analysed music and language between 'phonology, syntax and semantics', presenting music and language to be comprised of small, individual sounds; called phonemes in language and notes in music. 'Music represents an integral part of the human culture, and particularly language and communication; music can be a powerful tool in the learning experience' (Salcedo 2010). Moreno (2009) asserts that music has influences on the brain at both functional and structure levels; this impacts several areas, especially language. Moreno (2009) conducted an experiment in which a longer period of musical training was shown to improve and facilitate language pitch processing; it appears that there are similar features between music and language, music may be applied to improve and shape language learning.

## 6.4 Music learning styles

As mentioned above, musical intelligence is about a person's ability to understand and appreciate sounds, rhythm, pitch and timbre and the ability to 'process rhymes and other auditory information' (Logsdon 2010). Music is considered to produce a state of mind that makes the brain relaxed and comfortable enough to receive inputs; furthermore, music stimulates the brain and activates subconscious vocabulary, language structure acquisition and memorising (Salcedo 2010).

A music learning approach can be understood as applying musical intelligence in the classroom and adopting the theory of multiple intelligences in actual learning (Salcedo 2010). Musical learning styled people can appreciate many different types of music and sounds. 'People with musical learning styles learn best when taught using spoken instruction and auditory media. Musically learning styled students have good auditory memory and may respond well to jingles and rhymes to help memorise information they may otherwise struggle with' (Logsdon 2010).

## 6.5 e-Learning approach

In contrast to traditional classroom learning, e-Learning focuses on the virtual learning environment, and all operations are carried out online. Learners can visit and connect learning resources or information before and after learning. It increases the flexibility regarding schedule and locations, and people do not need to learn in a traditional classroom rather they can learn through the Internet (Oh 2003). The importance of e-Learning is growing day by day because it removes geographical barriers, saves time and money to get together in a traditional classroom and provides just-in-time learning wherever and whenever you want (Adhikari 2011).

## 6.6 Culture and language distance influence stability

Harris (2001) states that one can fully understand another culture only when he or she knows the language and will know their own culture better when they can understand another's culture. Ginsburgh (2005) shows that cultural inheritance and linguistic and culture distance also influence language acquisition and that they play an important role in addressing and improving cultural differences which, in turn, will help overcome regional instability.

## 7 Research methods

A case study and an online questionnaire were adopted for data gathering of this research. The potential target group for data collection was Chinese third level English language students and a small number of English language teachers. Pre-test and post-test metrics were used in a software application case study to collect data from Chinese students in a Waterford Institute of Technology Bridging Course. An online survey questionnaire was then used to gather information from Chinese English language students in China.

## 7.1 Case study design procedures

### *Pre-test:*

1. Separate target people into two groups: musical intelligence group and traditional group, the test group and the control group, respectively.
2. Record pre-test pronunciation of the 10 listed words.

### *Test:*

3. Review English words and phonetic representation.
4. Click each word to listen to native speaker.
5. The musical intelligence group will also hear a recording of musical notes.
6. The notes represent the high, low and stressed syllables and phonemes of each word.
7. The participant practises the pronunciation at the end of each recording.
8. The participant listens to each of the recordings TWO times.

### *Post-test:*

9. At the end of the session inform supervisor.
10. Record post-test pronunciation of the 10 listed words.
11. Complete online questionnaire.

## 8 Findings

To summarise, the approach to the musical methods case study comprised eleven Chinese students who were separated into two groups: a music group (focus group) and a traditional group (control group). Each of the groups had an initial pre-test, which recorded their pronunciation on 10 English words normally mispronounced by Chinese students. The music group was asked to practise these 10 words' pronunciation using music notes and native speaker English pronunciation as a learning approach. The traditional group was asked to attempt the same with a traditional approach using only native speaker pronunciation. After their practice on SWF files embedded in a web page, the researcher recorded their pronunciation again which is referenced as the post-test data.

According to their spoken English ranking system IELTS (2009) grade candidates by listening, a procedure followed by the researcher. There were two hypotheses that needed to be investigated (1) if musical intelligence helps the English pronunciation of all Chinese English language students with different intelligences and (2) if the students with musical intelligence improve more on English pronunciation than those without musical intelligence. The researcher had two native English speakers listen to

the pronunciation recorded in both pre-test and post-test of the Chinese students in the case study scenario and had these two native speakers mark each word. The researcher calculated each student's average grades and compared them as follows. The pre- and post-test data from the case study indicate that all participants show some degree of improvement (see Table 1; Fig. 1).

However, the music group did achieve more improvement than the traditional group (see Table 2; Fig. 2). Within the music group, students who self-profiled as possessing music intelligence show a higher improvement rate than self-profiled students of non-musical intelligence (see Table 2).

The questionnaire was sent to 51 Chinese English language students (including the eleven students in the case study). Forty-four responses were collected when the survey was closed. The response rate was approximately 86.27 %. To promote participation, the case study group was offered encouragements of Chinese drinks and snacks and assistance with problems associated with living in Ireland. Contact was made initially through the course tutor and then followed up by email, texts and QQ (online social tools). Some of the data collected from the questionnaire are shown below:

Table 3 shows that 47.7 % of respondents believe that English language may create benefits for their future education and career. These data demonstrate that most Chinese people learn English as they feel it is important for them.

Table 4 shows 83.4 % of respondents agreed that multiple intelligences can be a way to aid learning. It also suggests that most people agree that multiple intelligences can be applied to learning.

Table 5 demonstrates that of the 17 respondents who believe they have musical intelligence 16 of them also believed English language may benefit their future education and career.

Table 6 shows that of the respondents who believe they have musical intelligence, 35.3 % of them also have linguistic intelligence. It also shows people feel that musical intelligence is linked with linguistic intelligence.

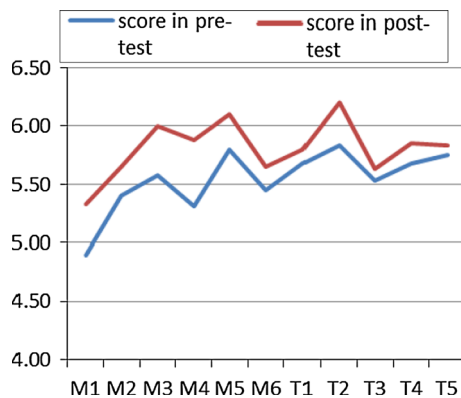
Table 7 demonstrates that of the 42.9 % of respondents who did not have confidence with their own English pronunciation had already learned English for 4 years or more. This table reflects the situation that most English language students have learning issues with English pronunciation even those who have already learned English for a long time.

Table 8 presents 63.6 % of the respondents who learn English online every week believed music and e-Learning approach can benefit remote area Chinese students' English language learning. This table shows most people feel the e-Learning approach will benefit equal learning resource



**Table 1** Average score of student groups

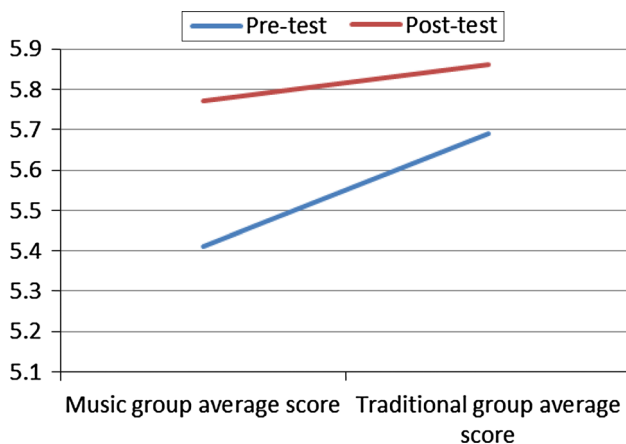
	Pre-test	Post-test	Improvement	Percentage improved
Music group average	5.41	5.77	0.36	6.60
Traditional group average	5.69	5.86	0.17	2.99



**Fig. 1** Pre- and post-test of individual students

**Table 2** Case study scores and improvements

	Musical intelligence students' average score	Non-musical intelligence students' average score
Pre-test	5.26	5.56
Post-test	5.74	5.80
Improvement	0.48	0.24
Percentage improved	9.10	4.30



**Fig. 2** Improvement post-test grades

distribution. Therefore, it may benefit improved stability and parity between rich and remote areas on language education resource availability.

**Table 3** English Language benefits future education and career

Do you believe that the English language may benefit your future education and career?		
Answer options	Response percent	Response count
Yes	47.7	21
No	36.4	16
Don't know	15.9	7
Total	100.0	44

The data from the online survey support the assertion that a majority of respondents believe there are problems with Chinese students' English learning environments and learning approaches in China. Of the respondents, 73.8 % agreed that music can help produce improved spoken English. Of the respondents, 66.7 % who often study English online found an e-Learning approach can remove the barriers of accessing the class from remote areas and create more opportunity for practicing with native English speakers.

## 9 Discussion

### 9.1 Discussion of case study findings

The data collected from the case study suggests Chinese English language students have more improvements with a music approach and most of the respondents from the survey agreed music can help produce native speech when learning the English language. Fisher (2001) and Quast (1999) suggested music impacts language acquisition. Wallace (1994) also argued that texts in songs are recalled better than just spoken text. These data support hypothesis one.

The case study also suggests musical intelligence students in the music focus group improved more than non-musical intelligence students in the same music group. Moreno (2009) proposed musicians have better language learning abilities than non-musicians. The data of this part support hypothesis two.

### 9.2 Discussion of survey findings

The online survey questionnaire will be discussed in the following four sections:

#### 9.2.1 Section A: profile

This section concerns student and teacher profiles. Of the respondents, 70.5 % are currently studying or teaching language and 91 % have learned English for 6 years or more. Of the respondents, 86.4 % believed there still is an

**Table 4** Musical intelligence helps learning

Do you agree that multiple intelligences (e.g. math, linguistic or art, etc.) can help learning?							
Answer options	Strongly agree	Agree	Neither	Disagree	Strongly disagree	Rating average	Response count
Rating	1	2	3	4	5	1.98	
Count	12	23	4	2	1		42
Percentage	28.6	54.8	9.5	4.7	2.4		100

increasing number of Chinese English language students and 47.7 % of respondents agreed that the English language benefits their future education and career. Yeh (2005) proposes there is an increased popularity in English language learning. Of the respondents, 86.4 % agreed that they did not have enough opportunities to practice English with a native speaker. Wang (2007) argued there is a limited English language learning environment in China. Of the respondents, 47.7 % feel their current learning approach can be improved; however, 36.4 % do not think their current learning approach can be improved.

Le Breton and Weber (2003) suggested that the population and the cost of governing the population will affect the stability of a nation. China has the largest population in the world, with a huge gap between the rich and the poor within that population. China is also becoming a global player economically and politically. English language learning in China is so popular that a Musical Intelligence e-Learning English language learning approach will reduce learning costs and benefit learning outcomes. The approach will also help reduce some of the inequality between the richer and more developed regions and underdeveloped and poor remoter regions' English language learning environments and, in turn, benefit stability inside a transitional China. Mastering the English language will also benefit interaction between Chinese people and the rest of world.

### 9.2.2 Section B: musical intelligence

There are 83.4 % respondents who believe multiple intelligences can help learning, 61.4 % of respondents agree there are overlaps between musical intelligence and linguistic intelligence. Smith (2002) suggests musical intelligence and linguistic intelligence share parallel structures. Of respondents, 54.8 % feel that music benefits all Chinese students' English learning. Guglielmino (1986) and Richard-Amato (2003) proposed music made language learning enjoyable and interesting.

### 9.2.3 Section C: music and pronunciation

Of respondents, 42.9 % show they do not have confidence in their own English pronunciation, and most of these students

**Table 5** Musical intelligence English language learning benefits

Q6 Do you believe that the English language may benefit your future education and career?			
Answer options	Q12 Do you believe you have musical intelligence/talent? Yes	Response percent	Response count
Yes	16	94.1	16
No	0	0.0	0
Don't know	1	5.9	1
Total	17	100.0	17

have also learned English for 4 years or more; 45.2 % felt they had difficulty learning English pronunciation, while only 7.2 % found it easy to learn pronunciation. Shoebottom (2011) asserted that these difficulties with pronunciation for Chinese students often originate in the natural differences between the English and Chinese languages. Of respondents, 59.5 % do not feel they could easily improve their English pronunciation and accent. Over half of the respondents believed music benefits more English language learning for those with musical intelligence than those non-musical intelligence students. There are also over half of respondents who agreed that learning the English language online offers more benefits than fully traditional classroom approaches.

### 9.2.4 Section D: perceptions

There are over 60 % of respondents who feel that music and e-Learning approaches improve learning by creating natural speaking environments, interaction opportunity and removes difficulties of accessing a classroom when living in remote areas. The data from this section show that most of the respondents have a positive perception on music intelligence used to help learning, this supports hypothesis three. Adhikari (2011) stated that e-Learning is growing day by day and it also removes the limitations of time and locations. Ginsburgh (2005) stated that culture and language distance will influence stability. An e-Learning approach will remove these limitations and help new language learning, this will also improve cross-cultural communication, interaction and understanding.

**Table 6** Music and other intelligences

Q13 What other intelligences (talents or aptitudes) do you feel you possess?(select at least one)			
Answer options	Q12 Do you believe you have musical intelligence/talent? Yes	Response per cent	Response count
Linguistic (language)	6	35.3	6
Mathematics(math)	4	23.5	4
Bodily kinaesthetic intelligence (physical and body)	6	35.3	6
Spatial intelligence (space and patterns)	2	11.8	2
Interpersonal intelligence (social skills)	6	35.3	6
Intrapersonal intelligence (independent and self-reliant)	6	35.3	6
Total			17

**Table 7** Years learning English and pronunciation confidence

Q16 Do you have confidence in your own English pronunciation?							
Answer options	Q4 How many years have you learned English?					Response per cent	Response count
	<1 years	1–3 years	4–6 years	7–9 years	>10 years		
Yes	0	1	1	7	11	47.6	20
No	0	0	2	9	7	42.9	18
Do not know	0	0	0	3	1	9.5	4
Total	0	1	3	19	19	100.0	42

**Table 8** e-Learning approach and remote areas

Q27 Do you believe that music and e-Learning can overcome the problems of access to learning experienced by students in remote areas?					
Answer options	Q22 If you have learned English online how many hours did this involve a week?			Response per cent	Response count
	1–4 h	5–9 h	>10 h		
Yes	14	4	3	63.6	21
No	2	1	2	15.2	5
Do not know	6	0	1	21.2	7
Totals	22	5	6	100.0	33

## 10 Limitations

There was no formal aptitude test for musical intelligence used on Chinese English language students in the case study, but instead, the researcher relied on self-profiling. This may have an influence on group separation. As the researcher's music knowledge was limited, the music notes synchronisation with word phonemes may be improved with songs and melodies to generate better learning resources and environments.

The means of contacting Chinese English language teachers in China were limited. The researcher adopted a quantitative survey approach to gather information regarding the perception of these teachers on using musical

intelligence on Chinese students' English pronunciation and accent. The study may be improved by using a qualitative approach such as personal interviews.

The Chinese students in the Bridging Course in WIT 2011–2012 are mostly from Henan and Fujian provinces. People in different provinces in China have different accents, which may affect their English language learning, especially English accent acquisition. If the researcher organised a wider sample of Chinese students from different provinces, it may make the findings more accurate and generalised.

The researcher has limited experience on software development. The data gathering instrument may improve with improved software skills and experience. Time



constraints on survey methods did not allow further qualitative survey approaches, such as interviews.

## 11 Conclusion

Case study data support the hypotheses: that musical intelligence is a valid approach to teach English to Chinese students with different intelligences, and a music e-Learning approach improves the pronunciation and accents of Chinese language students with music intelligence. The data from the survey mainly show the issues and difficulties of Chinese students learning English pronunciation. These data confirm that music intelligence has a positive perception amongst English language teachers and Chinese third level students. Subsequent analysis of this data suggests that a music intelligence e-Learning approach benefits the English pronunciation of Chinese third level students. The e-Learning approach fits in the theme of low-cost technological solutions for less developed regions, and the whole research topic is relevant to systems engineering education as a stabilising influence in development. This research may also make a contribution to new knowledge in systems engineering and international stability.

There is still more research required, such as applying Gardner's multiple intelligences theory to the development of e-Learning and applying social media to language learning. These approaches may also assist the learning of other languages. Developing structured online e-Learning systems for language learning will be useful when combined with music styles tailored to different languages.

## 12 Further research

Some further research areas are suggested as follows:

1. Develop a system where participants can type any word to review the related pronunciation.
2. Test song as a means of improved learning rather than just music notes.
3. More research could focus on the listening and understanding abilities of Chinese English language students and their impact on acquiring proper pronunciation and accent.
4. More study of automatic recording systems with digital ranking/grading according to the IELTS nine bands and native speaker benchmarks.
5. Investigate the impact of different provincial regional accents and combination of syllables and words on acquiring proper English pronunciation and accent.

## References

- Adhikari S (2011) Current trends in e-Learning. Available at: <http://elearningconcepts.wikispaces.com/Current+Trends+in+E-Learning>. Accessed at 8 Mar 2011
- Brick J (2004) China: a handbook in intercultural communication. Macquarie University, Sydney
- Butzlaff R (2000) Can music be used to teach reading? *J Aesthet Educ* 34:3–4
- Eufrocina L, Paulcoto M (2008) Common errors in English (words mispronounced)—ESL lesson. [Online] available at: <http://www.eslteachersboard.com/cgi-bin/lessons/index.pl?read=910> (accessed at 16th Mar 2011)
- Fisher D (2001) Early language learning with and without music. *Read Horiz* 42(1):39–49
- Frith U (1985) Beneath the surface of developmental dyslexia. In: Patterson KE, Marshall JC, Coltheart M (eds) *Surface dyslexia*. Lawrence Erlbaum, Hove, pp 301–330
- Gardner H (1983) *Frame of mind: the theory of multiple intelligences*. Basic Books, New York
- Gardner H (2000) *Intelligence reframed: multiple intelligences for the 21st century*. Basic Books, New York
- Ginsburgh V (2005) Languages genes, and cultures. *J Cult Econ* 29:1–17
- Guglielmino LM (1986) The affective edge: using songs and music in ESL instruction. *Adult Lit Basic Educ* 10(1):19–26
- Harris CD (2001) English as international language in geography: development and limitations. *Geogr Rev* 91(4):675–689
- IELTS Speaking Band Descriptors (public version) (2009) Available at [http://www.ielts.org/PDF/UOBDS\\_SpeakingFinal.pdf](http://www.ielts.org/PDF/UOBDS_SpeakingFinal.pdf) (accessed at 15 Sept 2011)
- Le Breton M, Weber S (2003) The art of making everybody happy: how to prevent a secession. *IMF staff papers* 50(3):403–435
- Logsdon A (2010) Musical learning styles—understanding musical learning styles. Available at: [http://learningdisabilities.about.com/od/resourcesresearch/qt/musical\\_learner.htm](http://learningdisabilities.about.com/od/resourcesresearch/qt/musical_learner.htm) (accessed 22 Dec 2010)
- Mills S (2001) The role of musical intelligence in a multiple intelligences focused elementary school. *Int J Educ Arts* 2:4
- Moreno S (2009) Can music influence language and cognition? *Contemp Music Rev* 28(3):329–345
- Oh CH (2003) Information communication technology and the new university: a view on e-Learning. *Ann Am Acad Polit Soc Sci* 585:134–153
- Oxford University Press (1991) *The concise Oxford dictionary*. BCA, London
- Quast U (1999) The effect of music on acquiring vocabulary with technically gifted students. *Gifted Educ International* 14(1): 12–21
- Richard-Amato PA (2003) *Making it happen: from interactive to participatory language teaching, theory, and practice*, 3rd edn. Pearson Education, White Plains
- Salcedo C (2010) The effects of songs in the foreign language classroom on text recall, delayed text recall and involuntary mental rehearsal. *J Coll Teach Learn* 7(6):19–30
- Shoebottom P (2011) The difference between English and Chinese. [Online] available at: <http://esl.fis.edu/grammar/langdiff/chinese.htm> (accessed at: 20 Oct 2010)
- Sloboda JA (1990) Music as a language. In: Wilson FR, Roehmann FL (eds) *The biology of music making: proceedings of the 1987 Denver conference*. MMB Music, St. Louis, pp 28–43
- Smith MK (2002) Howard Gardner and multiple intelligences, the encyclopedia of informal education. Available at: <http://www.mfed.org/thinkers/gardner.htm> (accessed 27 Dec 2010)

- Stokes J (2008) The effects of music on language acquisition. *CELE J* 16:23–32
- Wallace WT (1994) Memory for music: effect of melody on recall of text. *J Exp Psychol Learn Mem Cogn* 20(6):1471–1485
- Wang S (2007) Teaching English as a second language in China/ Enseignement De L'anglais Comme La Seconde Langue Etrangere En Chine. *Can Soc Sci* 3(3):106–108
- Yeh A (2005) New dawn in a shared language: the ascent of English part 2: China: many more Chinese are learning English to further their opportunities, driving the market for education, says Andrew Yeh. *Financial Times*, 13th, April, p 12
- Zhao BH (2010) How to enhance cross-cultural awareness in TEFL. *Cross Cult Commun* 6(2):100–104