eLFA2015

Addressing the Pedagogical Challenges of Mobile Applications to Support Ubiquitous Learning

Prof. Christopher Keyes
Dr. Ronnie H. Shroff
Dr. Warren Linger

Hong Kong Baptist University

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Background

Work from new inter-institutional educational support project

- HKBU and HK PolyU *Schoold of Design*
- Operational for 4 months

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Background

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Background

All about addressing pedagogical issues with mobile applications.

Ubiquitous Learning

- Term *Ubiquitous Learning*, from *Ubiquitous Computing*

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Ubiquitous Learning

- a.k.a. Pervasive Computing

1960s
1 computer-many users |

1980s
1 computer-1 user |

2000s
1 user- many computers

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Background

Students accustomed mobile-learning supporting interactive content.

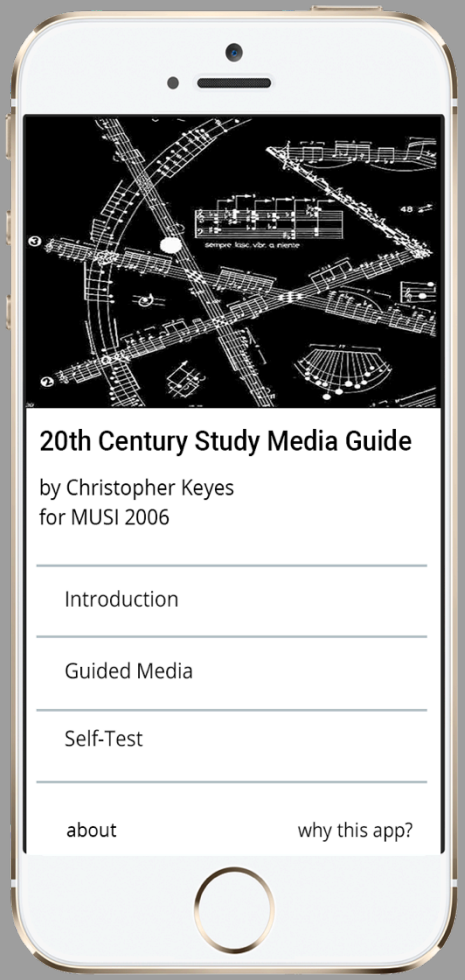
Background

Students might learn more ***commuting*** to a lecture, than ***in*** the lecture.

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Background

- That’s what we do



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

User experience

Important difference in our apps

User experience

Web-based:

Content →

On a server →

Student user →

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

User experience

Web-based:

Content →

On a server →

Student user →

- sluggish response to media
- uses up data-plan

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

User experience

Avoid the frustration of media over the internet:

- Rewinding, fast-forwarding clumsy
- Pages take time to load

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

User experience

All the content of our apps are downloaded with the app:

- media and interactivity instant and fluent
- no cost of use
- makes copyright compliance easier

Ubiquitous Learning

Inline with recent instructional design:

- a shift toward a user-centric perspective
- learners' instant access to content

Pedagogical Challenges

My Background

- Teach music students 20th century music and music technology
- Last 6 years writing software for my students

Pedagogical Challenges

Context:

- Undergraduate students in traditional univ. setting

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
普存學習與綜合教學資源中心

Pedagogical Challenges

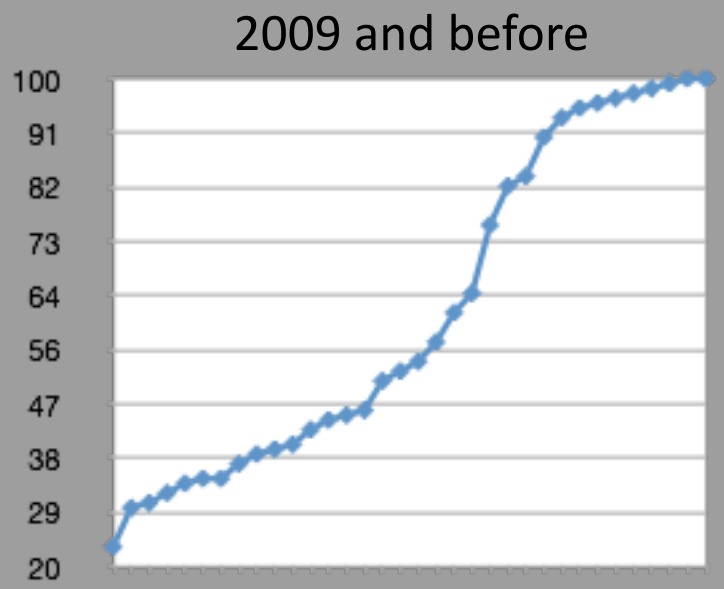
My experience:

- use can make a significant difference in student learning
- example: *20th-century Music Study Guide* (2010)
  - A desktop app

Pedagogical Challenges

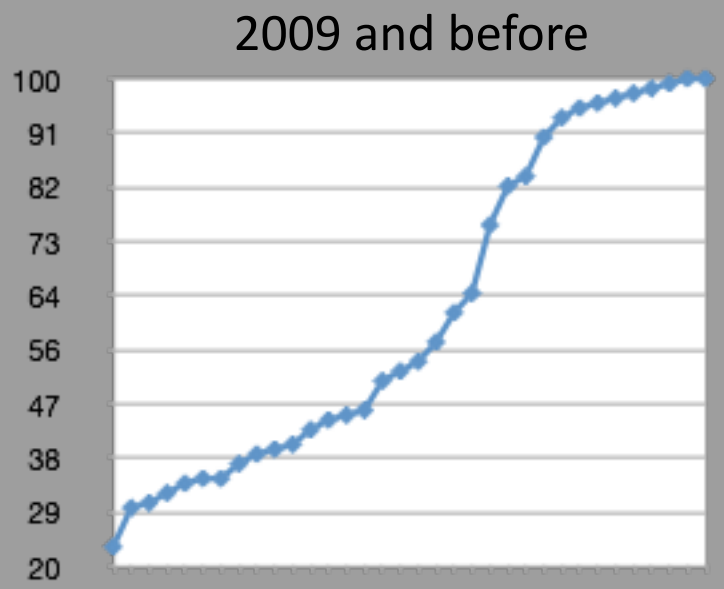
Pedagogical problem:

- results of final listening exam (typical)



Pedagogical Challenges

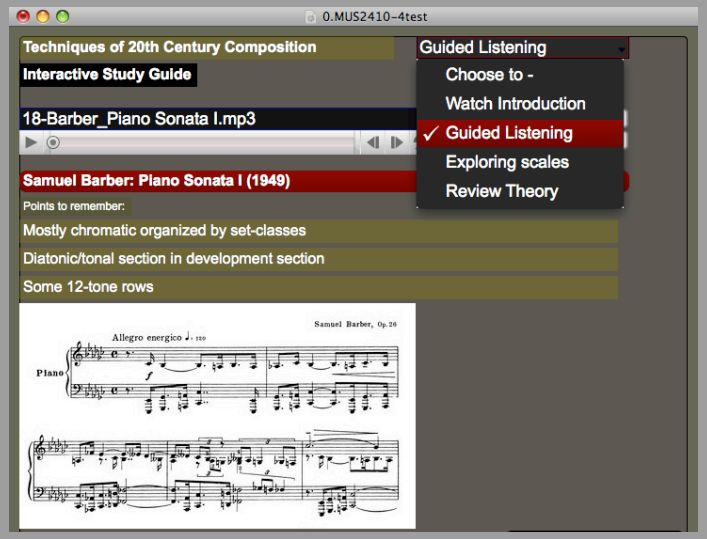
If they don’t know the music, talking about it is pointless.



Pedagogical Challenges

Enter: *20th-century Music Study Guide* (2010)

- simple design
  - pull-down menus for pieces to be studied
  - 3 points to remember
  - representative image

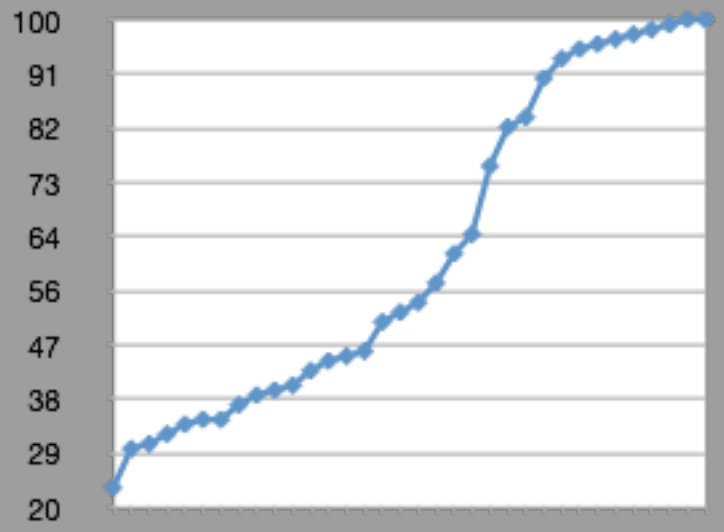


ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

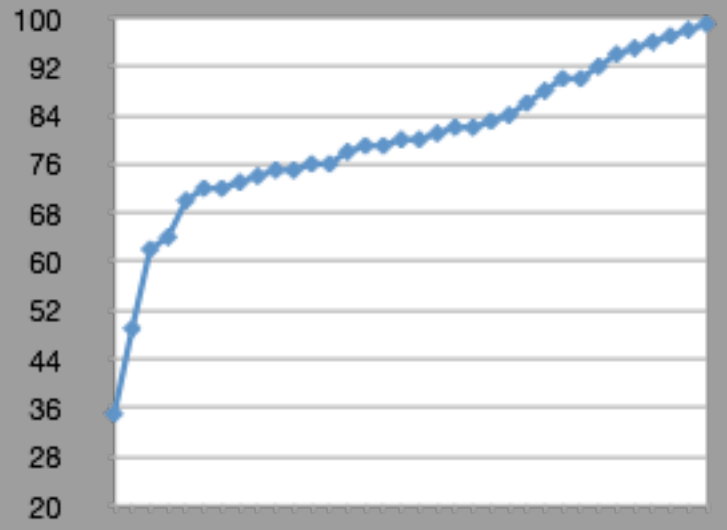
Pedagogical Challenges

Results of final listening exam: before and after *20th-century Music Study Guide* (2010)

2009 and before



2010

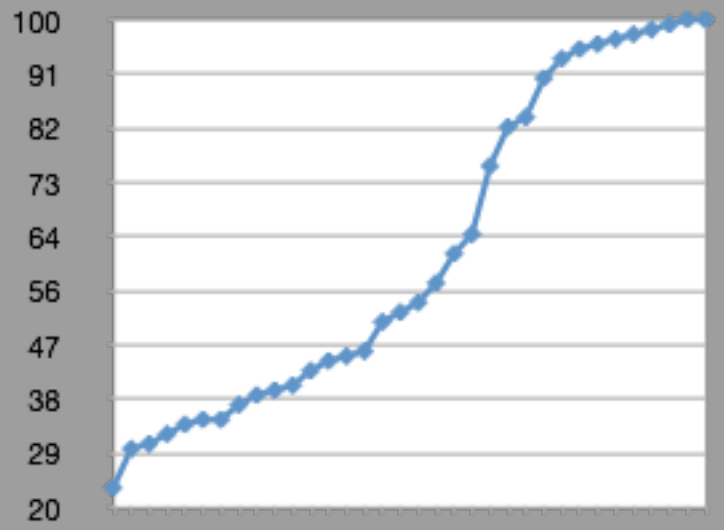


ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

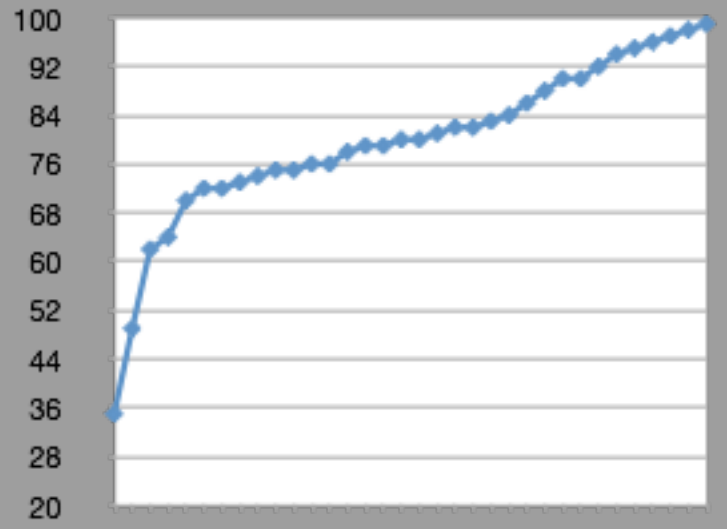
Pedagogical Challenges

Never read that app was counterproductive…but

2009 and before



2010

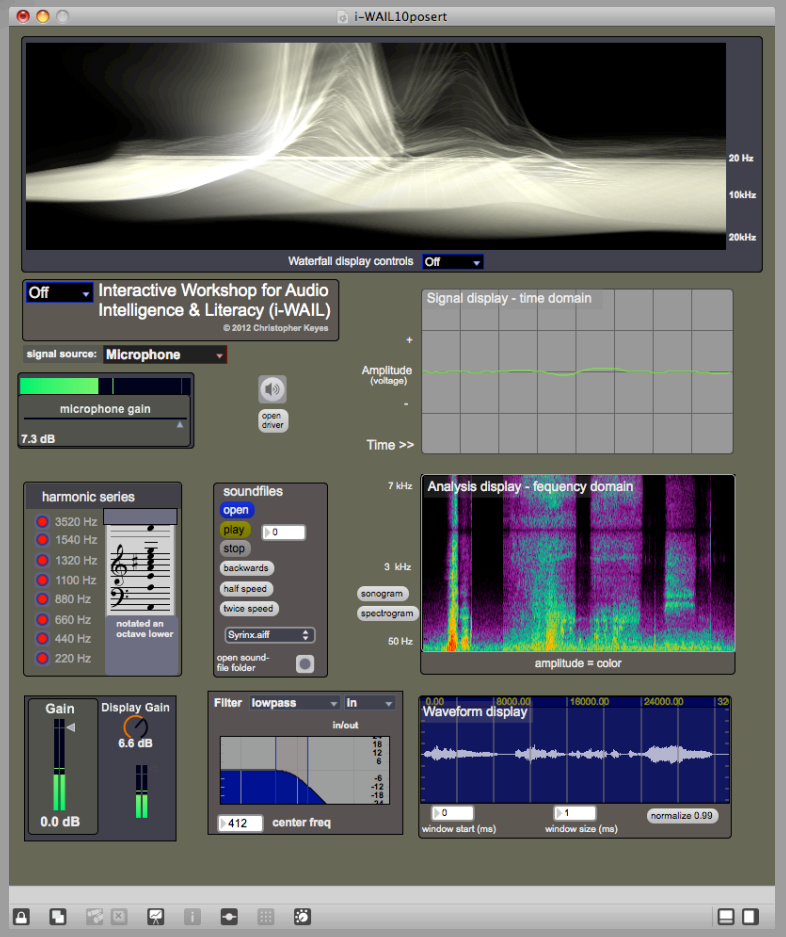


ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Pedagogical Challenges

My other experiences & literature show:

- possibility *of insignificant gains*
- not at all proportional to the amount of work it takes



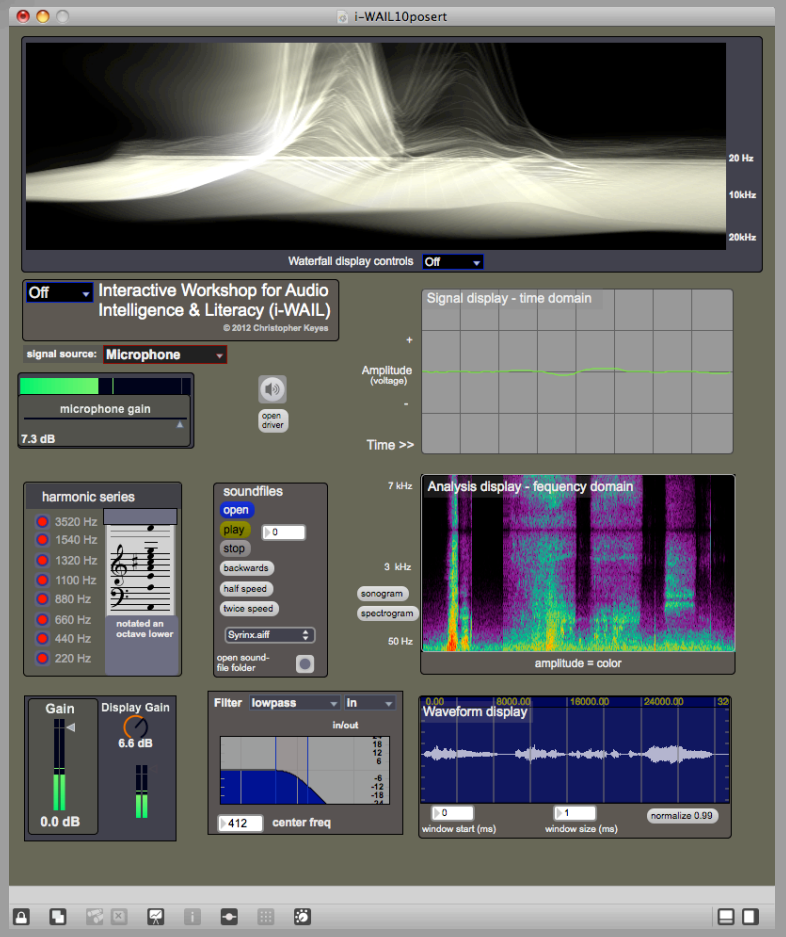
ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy

Pedagogical Challenges

Example: i-WAIL

Interactive Workshop for Audio Intelligence and Literacy

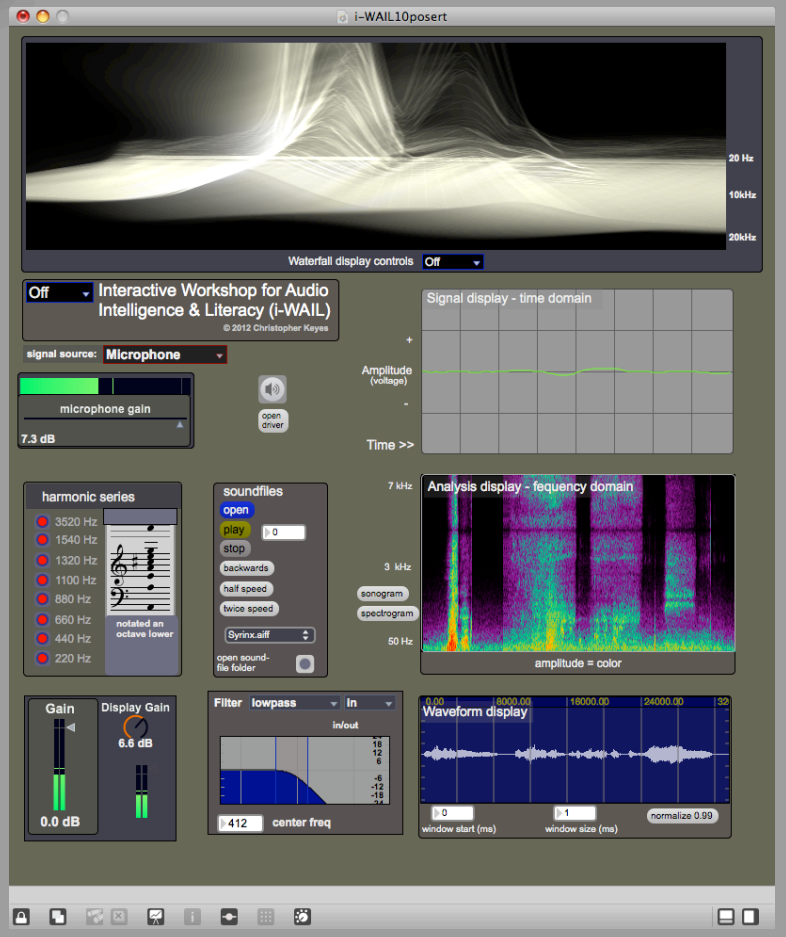
Issue : help display aspects of sound visually



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
普 存 學 習 與 綜 合 教 學 資 源 中 心

Pedagogical Challenges

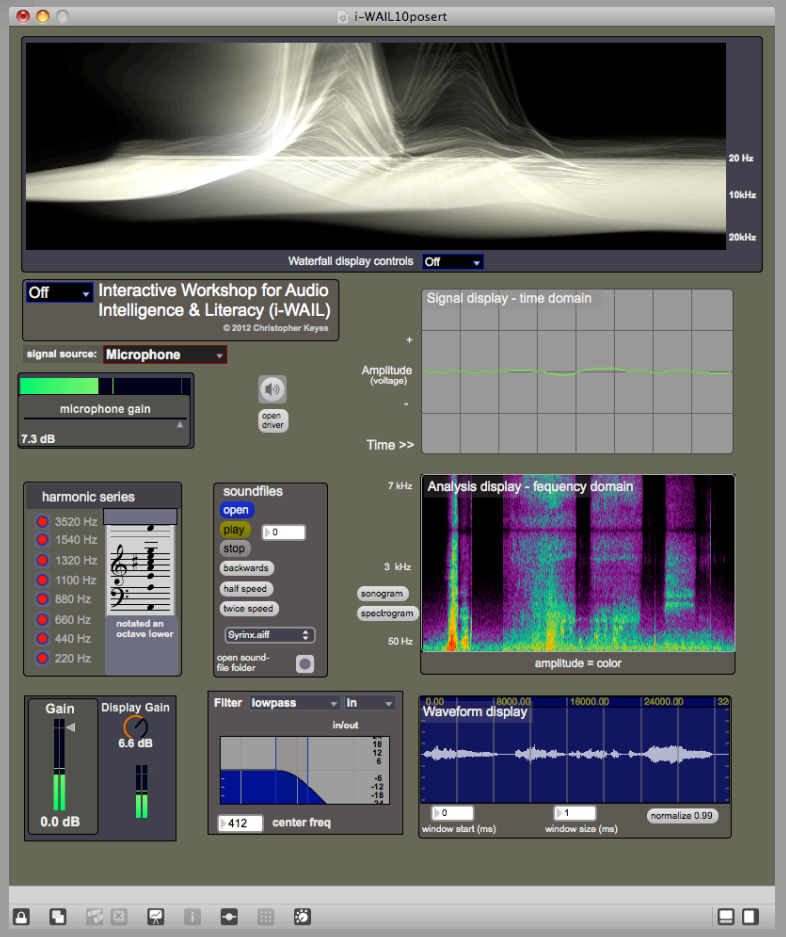
- 4 sound analysis tools
- 27 self-study, interactive tutorials
- over 250 photos, sound examples, and videos
- utilizes visual, aural, and tactile learning modalities for students of different backgrounds..



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
普存學習與綜合教學資源中心

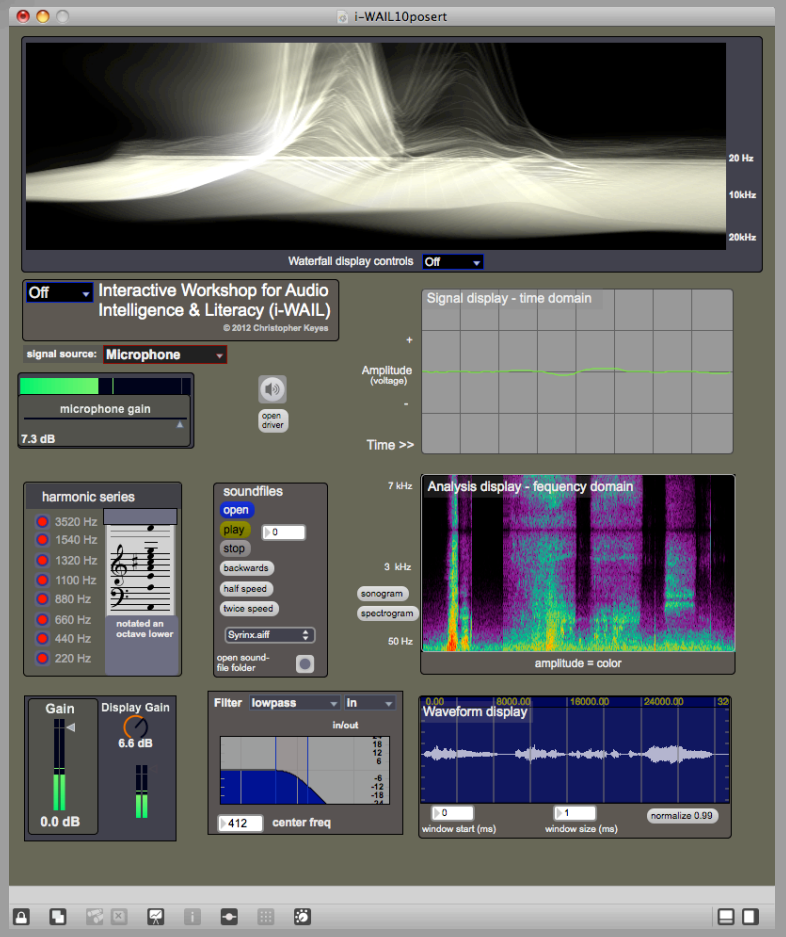
Pedagogical Challenges

…but still was not very effective; especially the first time I used it.



Pedagogical Challenges

…*very* bitter experience



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Pedagogical Challenges

Natural focus on

1. functionality
2. content

Pedagogical Challenges

Focusing on

1. functionality; what cool things could we do?
2. content

Can lead to *expensive* and marginally effective materials

Pedagogical Challenges

Easy to overlook

- educational **design**
  - how will this app integrate, pedagogically, into the course?

Pedagogical Challenges

Easy to overlook

- educational **design**
  - how is the content going to be reviewed and contextualized?

Pedagogical Challenges

Easy to overlook

- **design** of navigation and flow

Pedagogical Challenges

Easy to overlook

- **design** of navigation and flow
  - Are there **visual** and **conceptua**l prioritization?

Pedagogical Challenges

Easy to overlook

- **design** of navigation and flow
  - Are there visual and conceptual prioritization?
  - How is the eye going to be guided to the most important images/ideas on the page?

Pedagogical Challenges

Easy to overlook

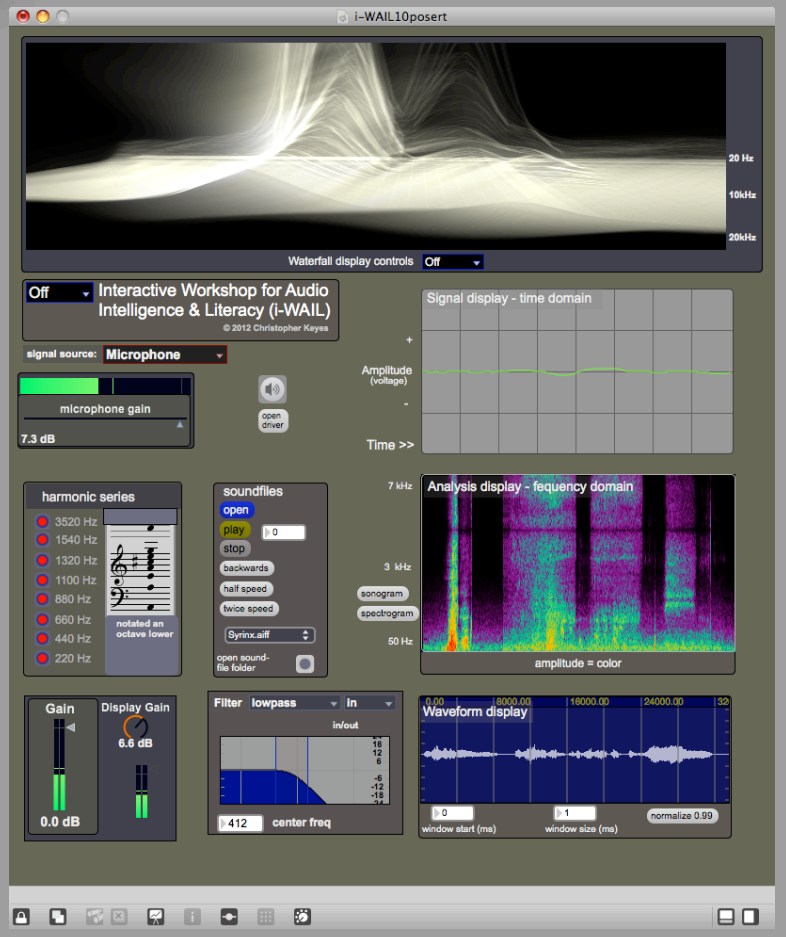
- **design** of navigation and flow
  - Are there visual and conceptual prioritization?
  - How is the eye going to be guided to the most important images/ideas/navigational tools on the page?
  - Will the navigation and hierarchy of information be transparent?

Pedagogical Challenges

Most find the functionality and content of i-WAIL impressive, but

Major design problems

1. does not guide the user on how to use it
2. does not inform the user of why any of it is important
3. does not review material nor resent problems
4. flow of menus and content not obvious to user
5. far too much material for a single application –>
6. overwhelming and does not give students confidence
7. ‘Un-fun’
8. Etc
9. etc.



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

Pedagogical Challenges

Our design priorities

Pedagogical Challenges

Design

(1) their overall **design must be transparent**

- easy/fun to use, and aesthetically pleasing
- they must **compete in the mobile ecosystem** of other apps, all vying for their attention; and

Pedagogical Challenges

Purpose

(2) the apps should **target specific pedagogical problems**

- demonstrably difficult to address in the classroom;

Pedagogical Challenges

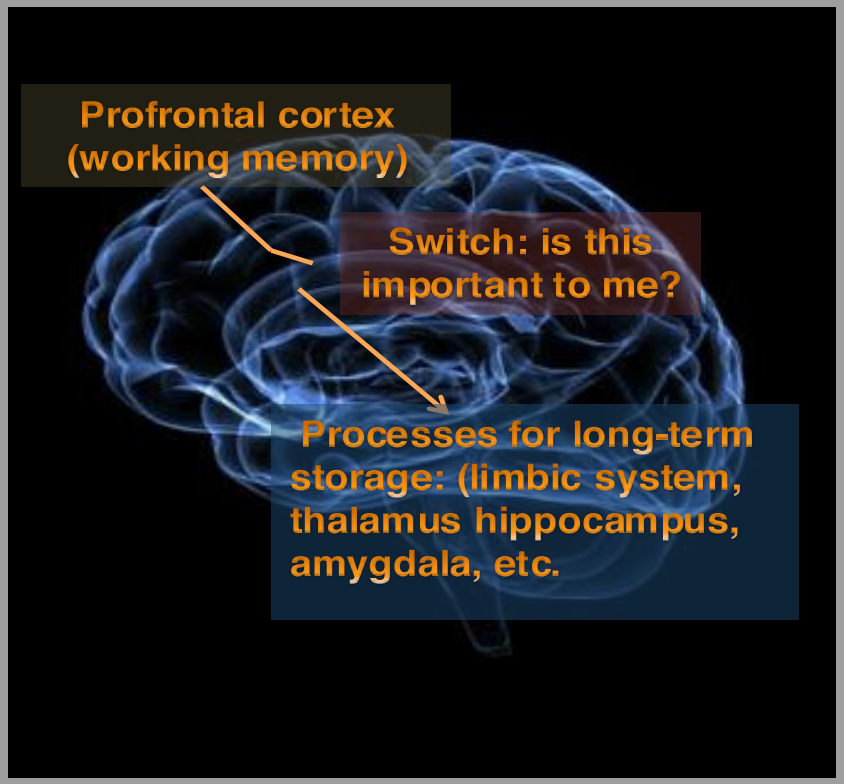
Significance/motivation

(3) crystal clear to the student

- **why the app's content is important** to them
- **how it will be used and/or assessed in the course**

Pedagogical Challenges

Significance switch: is this important enough to be processed for long-term memory?



Ubiquitous Learning

Relatively little information on:

- types of apps most effective
- use in various disciplines/pedagogies

App Categories

Goodwin and Highfield proposed three broad categorizations

1. Instructive
2. Manipulable (*subject-area & reference)*
3. Constructive apps

App Categories

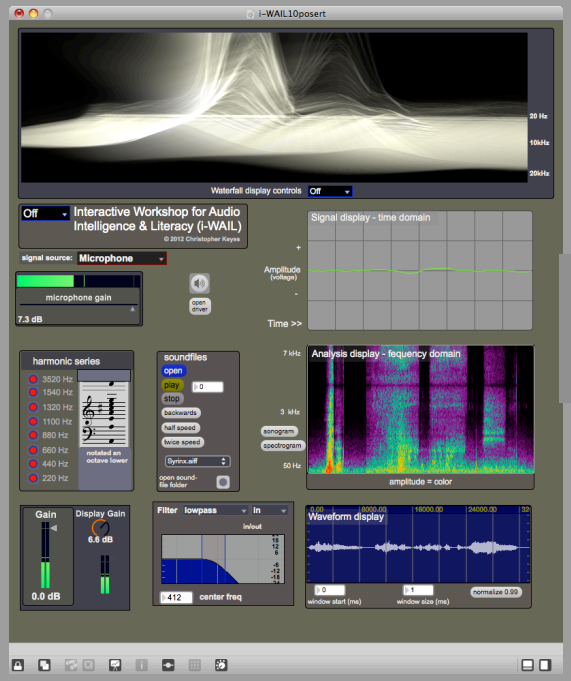
1) Instructive apps

- promote rote memorization of content through recall and drill-and-practice activities.
- often with flashcard interface

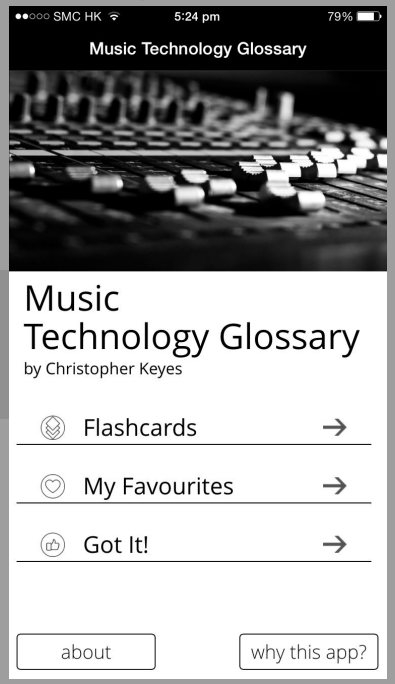
App Categories

1) Instructive apps

Example - *Music Technology Glossary*



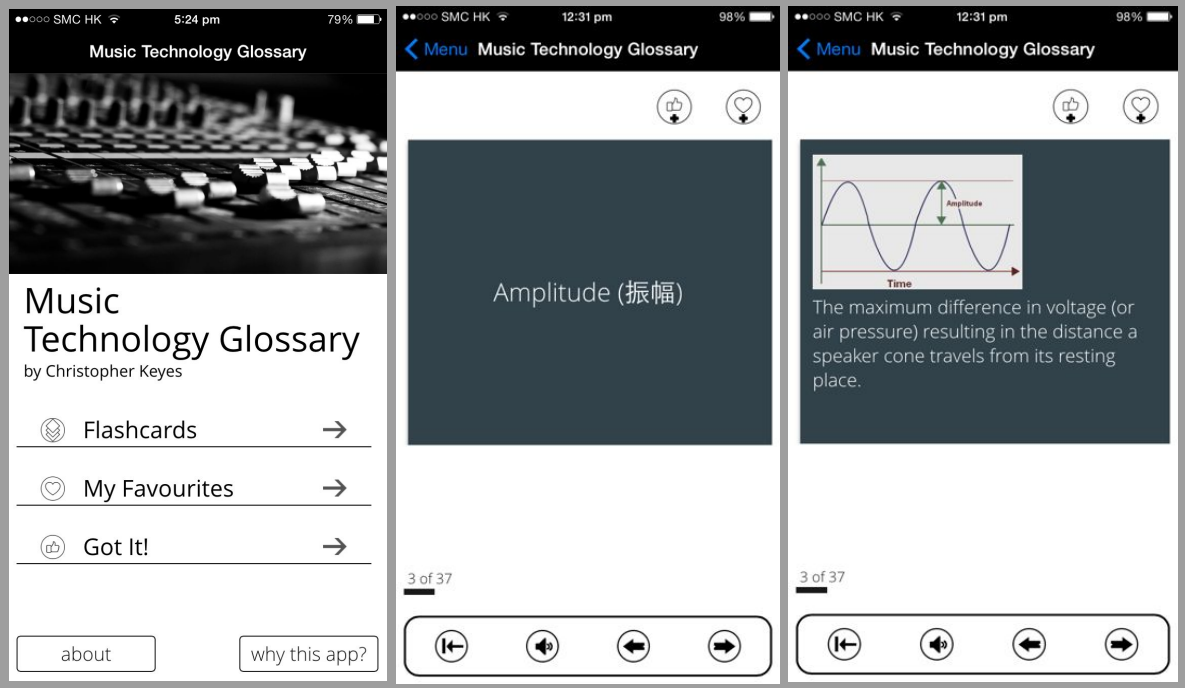
Glossary from i-WAIL is now ➔



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

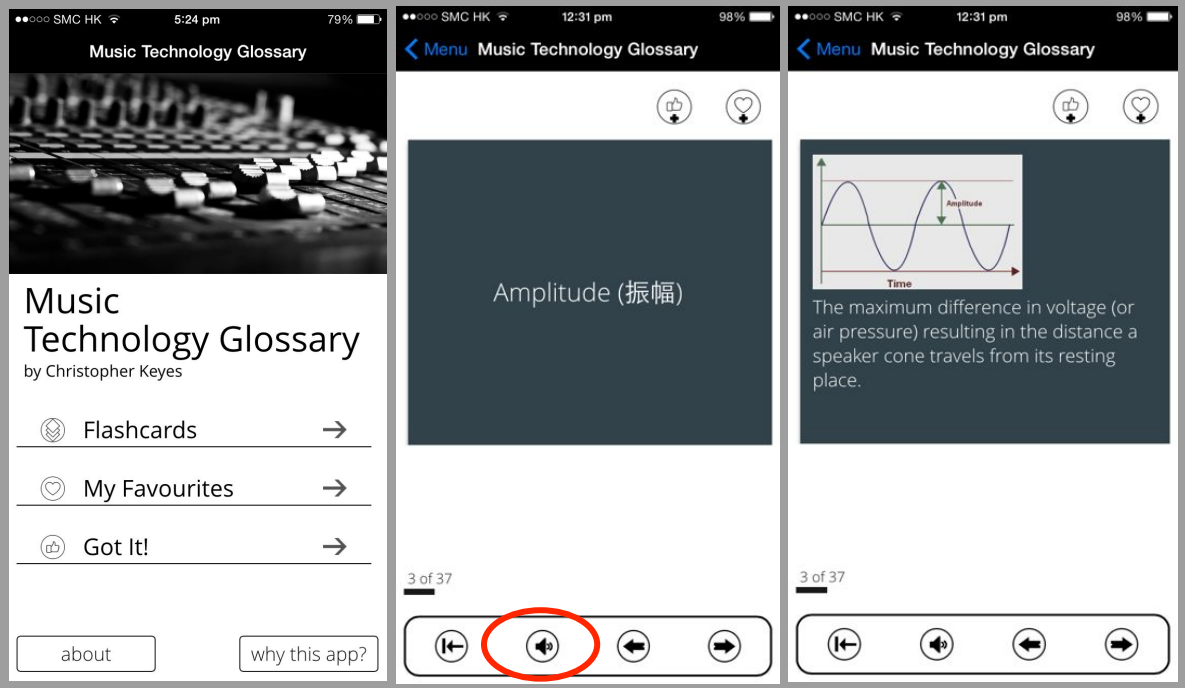
Home screen and example front/back screens



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

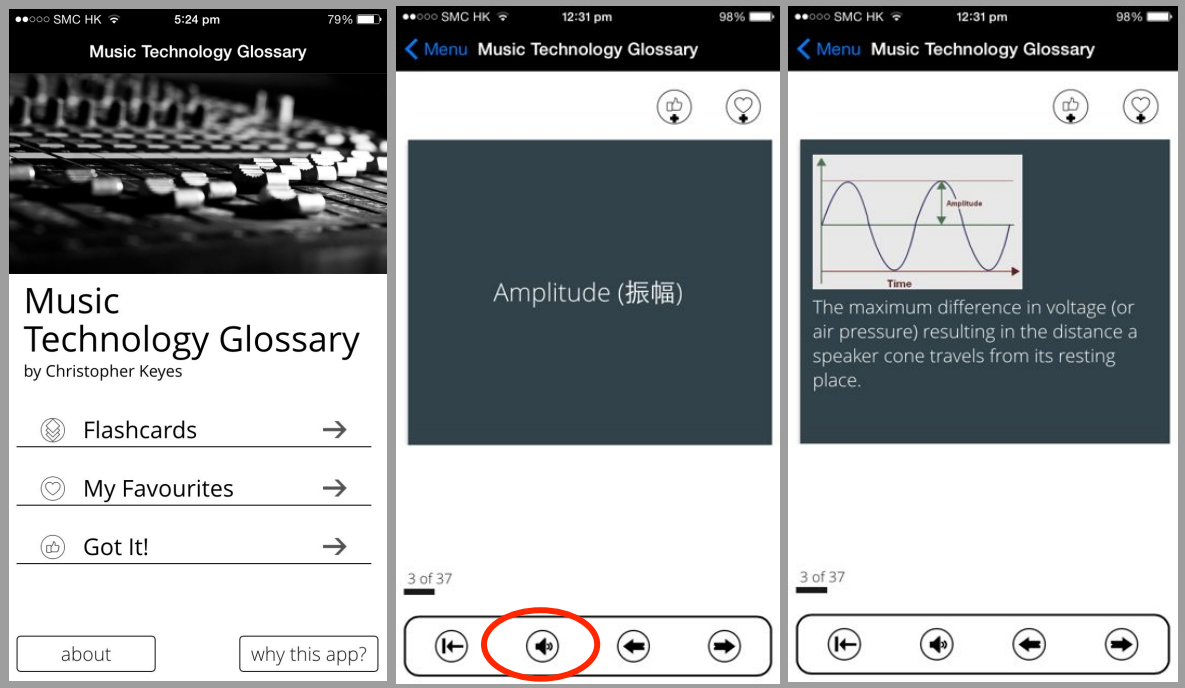
Unlike an exam, feedback is instant,



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

and can be pronounced (promote use of earphones).



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

Design informed by above requirements:

1 – use & navigation is transparent

2 - targets specific pedagogical need

3 – emphasizes its significance

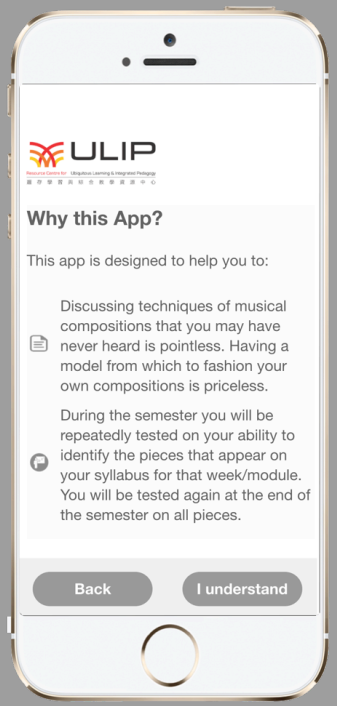
- via a '**why the app?'** screen.

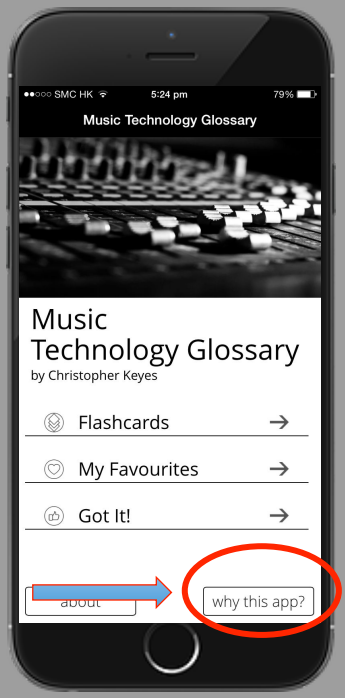
ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

Presented first time app is used and on home screen:

- **why the app's content is important** and
- **how it will be used and/or assessed in the course**





ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
普存學習與綜合教學資源中心

App Categories

Although low on rigor these are high in significance :

- can help understanding lectures and discussions
- can help build confidence

ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

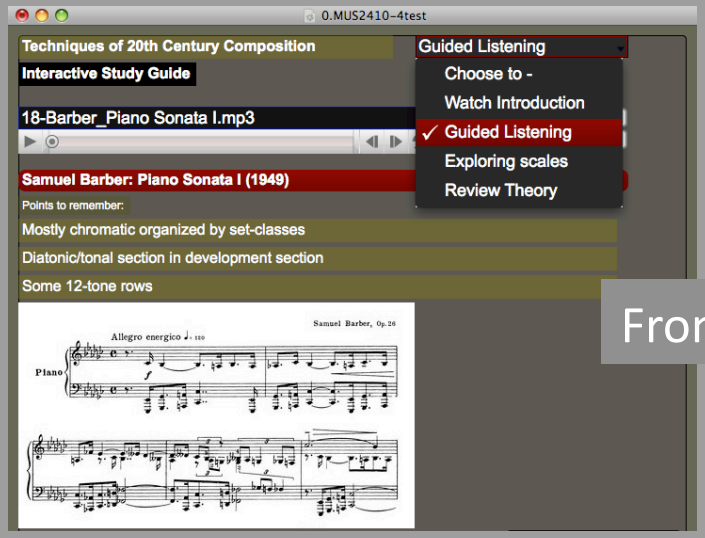
Although low on rigor these are high in significance :

- Enable more higher level learning in class
- able to apply in solving complex problems

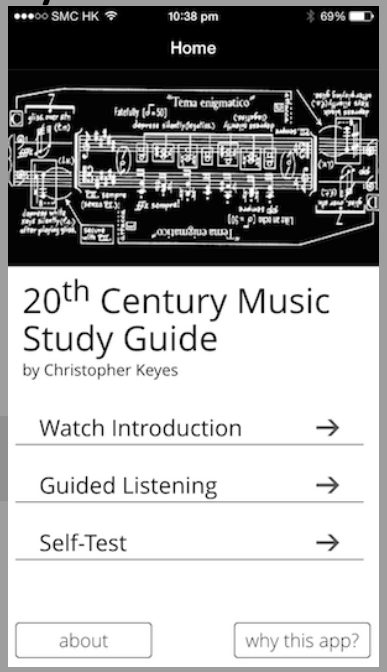
App Categories

Manipulable (*subject-area apps*) offer students guided discovery

- Example: 20th Century Music Study Guide



From this to ➔

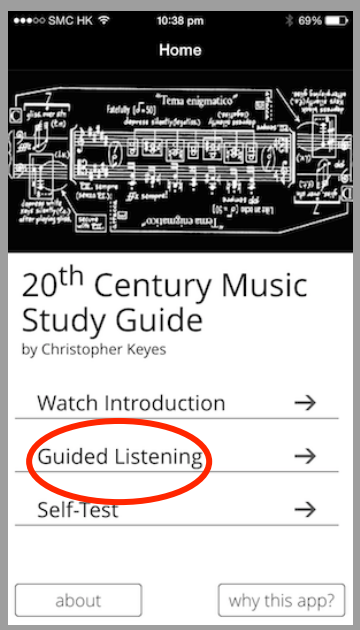


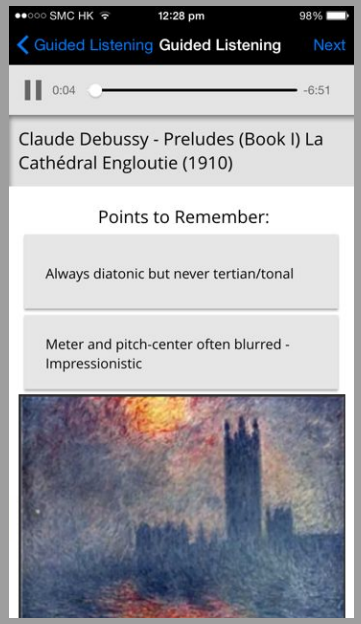
ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
普及學習與綜合教學資源中心

App Categories

20th Century Music Study Guide (guided listening)

- Typical screen order:
  - select piece, listen, and read points to remember



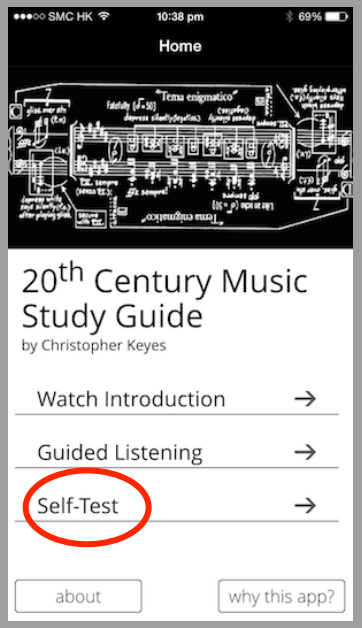


ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

20th Century Music Study Guide (guided listening)

- Also has gaming engine (self-test) for fun and to monitor improvement

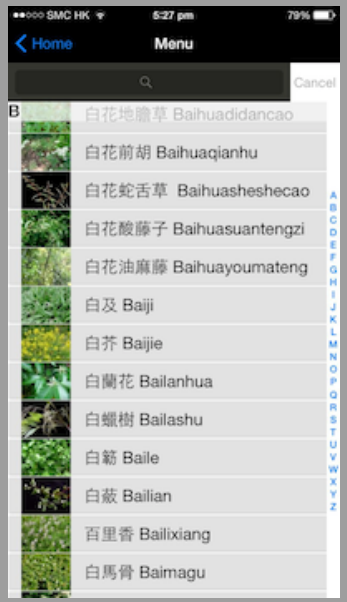


ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

Manipulable (*reference apps*) Example: Chinese Medicinal Plant Database

- Typical screen order:



ULIP
Resource Centre for Ubiquitous Learning & Integrated Pedagogy
遍存學習與綜合教學資源中心

App Categories

3) Constructive apps

- transform learned information into usable forms
- create learning artifacts
    - (e.g. videos, creative writings, images, multimedia presentations, visual representations of their learning)

App Categories

3) Constructive apps

- with these type of apps, **efficacy** of using mobile technology, vs. in-class or individual contact becomes less clear.

Conclusions

Focusing exclusively on *functionality* and *content* can lead to:

- marginally effective educational apps
- may not be worth the effort

Conclusions

Content developers and programmers are not necessarily good, trained designers.

Conclusions

Best to get help from people who are trained in design, who know

- How to avoid classic design mistakes
- Have sensitivity to alignment and other elements.

Conclusions

Best to get help from people who are trained in design, who know how to use

- Proportions
- Shapes
- Fonts
- Colors etc.

to convey the message you want to emphasize

Conclusions

Get design help.

Q & A