

Using Interactive Student Response Systems

- What is an Interactive Response System?
- Overview of Functions
- How to Implement the System
- Experiences

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Example of electronic student response system

Think of ask-the-audience in "Who Wants to be a Millionaire?"

Each student issued with a 'clicker' with unique ID

Receiver gathers responses

Laptop software analyses and presents responses

Can be used for marking, quizzes, multiple choice tests

Can be integrated with powerpoint / excel to incorporate marks

Easy to set-up from scratch

Several similar systems exist - I will only speak of PRS



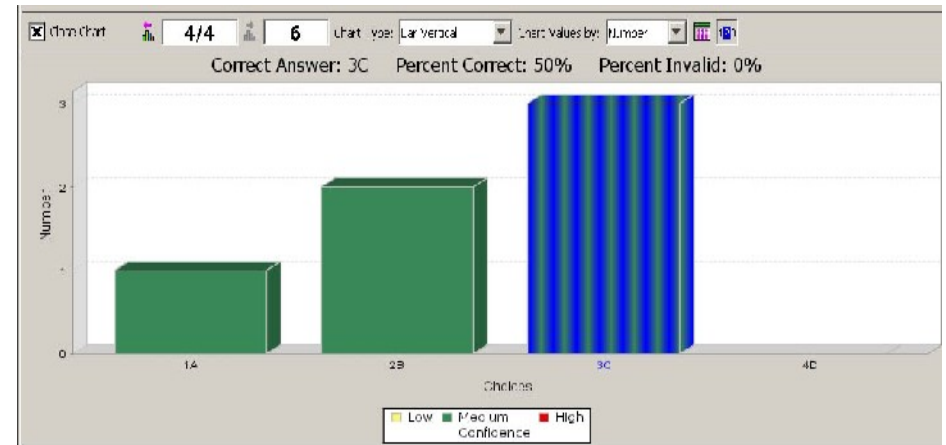
In lecture preparation:

create list of student names & clicker ID numbers
 set-up a list of multiple choice questions for each lecture
 during lecture ask students the question
 response is shown as a frequency histogram

System uses infra-red signals
 Works well with class size of ~50
 Larger classes need RF technology
 longer range (more expensive)

Total cost ~ £1800 (inc. VAT)

software
 50 clickers
 receiver



Terminology

- Class** - contains all information about the students & the course
- general information eg. course name, lecturer's name etc...
 - student roster
 - response map
 - default settings for the information display

Student Roster - links student name to transmitter ID

Response Map - virtual layout of 'seating plan' for display

Lessons - Sets of questions are defined here i.e. lesson = lecture

Sessions - Where the responses are stored and marked

Gradebooks - Where the total marks per student are accumulated

Flexible setup:

- can ask multiple choice questions with up to 10 responses

- can ask questions with a numerical response

- choose marking scheme (or none)

- students can visually verify their response has been registered

- responses are displayed anonymously

 - students cannot see who got the question wrong!

- can set time limit for responses

- can allow only one chance at answer, or many attempts

- students can associate a confidence level to their response

 - press **H** or **L** button first

- master transmitter allows lecturer to control questions/responses/delays...

New Class: Importing a Student Roster

Edit Class [X]

Information | Roster | Response Map | Response Window Defaults | Chart Window Defaults

Roster: C:\Documents and Settings\rizvi\My Documents\PRS\Roster\ESD_roster.csv

Double-click a Name or ID to change it

Line N...	Transmitte...	Last Name	First Name	Middle Initial	Student ID	Nickname	Net ID	Group ID
1	511005	thames	-	-	ap0001	-	-	0
2	511009	avon	-	-	ap0002	-	-	0
3	511027	severn	-	-	ap0003	-	-	0
4	511019	tweed	-	-	ap0004	-	-	0
5	511008	clyde	-	-	ap0005	-	-	0
6	511006	tees	-	-	ap0006	-	-	0
7	511025	medway	-	-	ap0007	-	-	0
8	511020	tay	-	-	ap0008	-	-	0
9	511018	dee	-	-	ap0009	-	-	0
10	511022	trent	-	-	ap0010	-	-	0
11	511023	mersey	-	-	ap0011	-	-	0
12	511014	lee	-	-	ap0012	-	-	0
13	511012	spey	-	-	ap0013	-	-	0

Import Roster... Remove Roster Delete Name Add Names... Report...

OK Cancel

InterWrite PRS - Sessions

File Connection View Help

Classes Lessons Sessions Gradebooks

New Lesson Edit Lesson Copy Lesson Delete Lesson
 Import Lesson Export Lesson Create Report New Session

Lessons

- ESD Questions
- NPA-21 Cosmology
- NPA-22 Nucleosynthesis
- NPA-23 Supernovae
- NPA-24 Medical Imaging
- NPA-25 Standard Model

New Question Edit Question Delete Question Copy Question
 Move Down Move Up Select All Unselect All

Selected	Number	Name	Time	Mode
<input checked="" type="checkbox"/>	1	weekend	00:30	Multiple Choice
<input checked="" type="checkbox"/>	2	helium	00:30	Multiple Choice
<input checked="" type="checkbox"/>	3	exports	00:30	Multiple Choice
<input checked="" type="checkbox"/>	4	Vilnius	00:30	Multiple Choice

A Lesson consists of a list of questions, answers, marks

Session	Lesson	Class	Date	Mode	Marked
11 22 2007	NPA-22 Nucleosynthesis	NPA	2007.11.22 14:52:16	Multiple Choice	<input checked="" type="checkbox"/>
11 29 2007	NPA-23 Supernovae	NPA	2007.11.29 15:07:26	Multiple Choice	<input checked="" type="checkbox"/>
11 30 2007	NPA-24 Medical Imaging	NPA	2007.12.18 11:23:20	Multiple Choice	<input checked="" type="checkbox"/>
12 06 2007	NPA-25 Standard Model	NPA	2007.12.18 11:23:51	Multiple Choice	<input checked="" type="checkbox"/>
04 28 2008	ESD Questions	ESD	2008.04.28 11:06:28	Multiple Choice	<input checked="" type="checkbox"/>

A Session records the student responses to a Lesson

The Session marks student responses to sessions Easy to manually override marks

Mark Session: (04 28 2008.csv) Class: (ESD)

Correct Answer Multiplier: 2 Wrong Answer Multiplier: 1 Gradebooks Statistics Close

Session Data Double-click to change value Correct Responses Mark Data

Question	Name	Trans ID	Student ID	Response	Question	Answer	Points	Seat/Name	Student ID	Mark	Possible Points	# Correct	# Responded ...
1	elbe -	511010	ap0019	10	1	None	1	elbe -	ap0019	10	12	2	4
2	elbe -	511010	ap0019	1	2	2	2	mersey -	ap0011	8	12	2	2
3	mersey -	511023	ap0011	2	3	2	2	tigris -	ap0017	6	12	1	2
3	elbe -	511010	ap0019	2	4	3	2	ouse -	ap0014	2	12	0	1
3	tigris -	503893	ap0017	2				spey -	ap0013	2	12	0	1
4	ouse -	511026	ap0014	1				ganges -	ap0020	4	12	1	1
4	spey -	511012	ap0013	2									
4	mersey -	511023	ap0011	3									
4	elbe -	511010	ap0019	3									
4	tigris -	503893	ap0017	2									
4	ganges -	511030	ap0020	3									

Mark Statistics

Number of Respondents: 25

Mean: 6.68

Standard Deviation: 0.9682974

Lowest Mark: 5

Highest Mark: 8

OK

Collects session statistics together

The Gradebook collects session marks from all sessions

Easy to manually override marks

Add/Delete Marks in Gradebook [X]

Add Mark
 Delete Mark
Update Names From Roster
Close

Double-click a student grade to change it

Gradebook: ESD.csv (using Roster from Class: ESD)

StudentID	Name	TOTAL	04 28 2008
ap0001	thames -	0	0
ap0002	avon -	0	0
ap0003	severn -	0	0
ap0004	tweed -	0	0
ap0005	clyde -	0	0
ap0006	tees -	0	0
ap0007	medway -	0	0
ap0008	tay -	0	0
ap0009	dee -	0	0
ap0010	trent -	0	0
ap0011	mersey -	8	8
ap0012	lee -	0	0
ap0013	spey -	2	2
ap0014	ouse -	2	2
ap0015	eden -	0	0
ap0016	euphrates -	0	0
ap0017	tigris -	6	6
ap0018	danube -	0	0
ap0019	elbe -	10	10
ap0020	ganges -	4	4

Other options also available - not yet explored
import into powerpoint directly
self-paced quizzes
incorporation with web-based tests (e.g. homeworks)

I implemented this in lectures last semester

- each student paid £10 deposit for clicker (so they don't lose them)
- money given back at end of semester in return for intact clicker
- students very enthusiastic
- positive comments in the student questionnaires

I found the system improved

- Attendance
- Attention
- Participation
- Feedback to me on conceptual grasp

Attendance

problem with my course: 9am lecture on Thursdays

clear correlation of attendance v performance

clickers can help with attendance

5% of total course mark to response from clickers

for each question:

1 mark for incorrect answer

2 marks for correct answer

rewards attendance at lectures

next year I plan to increase this to 15%

Attention

Use of questions “wakes up” the students ~20min attention span
I used 1-3 questions per lecture - about right
Each question takes ~few mins to pose, answer, discuss

Participation

Biggest benefit was enhanced student discussion and participation
Student can see how many others made same choice
If many students got it wrong: more emboldened to ask “why?”

Feedback

I got good / fast feedback on which concepts are not being understood
Better than a show of hands:

- more quantitative
- anonymous
- more participation