

## Ensuring Effective Use of PRS

### Results of the evaluation of the use of PRS in Glasgow University

October 2001 -June 2002

#### *Introduction*

The Personal Response System (PRS) has been used in 12 different classes in Glasgow University and also in several workshops and Open Days. The classes varied in subject, level and size: Computing Science, Medicine, Psychology; Levels 1-4 and GP's; approximately 15 to 300 students. The use of the system was evaluated using observations, informal interviews, and questions asked via the system and written student comments. From the evaluation it is possible to give some information which should ensure the effective use of PRS in the future. This paper also includes some examples of the types of questions used.

#### *Use of PRS in Glasgow University*

Dept. in Glasgow University	Class	Approx. number in class (not all attended session)	Number of Sessions
* Computing Science	Level 1 2001-02 (2 lecture theatres)	450	20 x 2
* Computing Science	Level 4		1
* Psychology	L 4 Education	40	3
* Psychology	L4 HCI	30	8
* Psychology	L 1 (2 lecture theatres)	500	3 x 2
* Philosophy	L2 Logic	100	9
* Philosophy	L1 Mind & Body	260	1
*Medicine	Medic. L3	250	3
*IBLS (Biology)	L2 (2 lecture theatres)	300	1 x 2
*IBLS (Biology)	L2	150	1
*Vet. Medicine	L 4	100	1
*Dental Medicine	GP's (short course) L 4	18 250	1 1

\* some evaluation carried out

Also used at several workshops, open days, conferences and at the Science Museum in London

#### *Some Uses of Handsets (PRS) at Glasgow University*

1. **General Usage** e.g. Philosophy; Computing Science
  2. Traditional lecture punctuated with the use of PRS
  3. May or may not involve discussion
  4. May involve revision; agree/disagree; understanding of material; identification of problems; reflection; study skills
- **Formative Assessment** e.g. Medicine; Biology; Comp. Sci.
  - Set of Multiple Choice Questions
    - Practice for exam; pre-lab tutorial; test
      1. May or may not involve discussion and re-vote

1. **Problems set during lecture** e.g. Computing Science
  2. Problem set by lecturer; attempted by students - vote when finished
  3. May or may not involve discussion and re-vote
  
1. **Large Group Tutorial** e.g. Statistics
  1. Lecturer working on examples
  2. Question - vote - discussion - vote
  
1. **Debate** e.g. Computing Science
  2. Before and after debate: For - Against - Abstain
  
3. **Fun:** Dentistry (Lecture for GP's)
  4. Lecture punctuated with questions on films and music

### *Design and presentation of questions*

Questions can be:

#### 5. **Prepared beforehand**

- in powerpoint
- on OHP

#### 6. **written on spot**

- in powerpoint
- on board
- visualiser
- OHP

#### 7. **verbal**

**PRS can be used in conjunction with:**

- powerpoint
- slides
- OHP
- Board
- video link

### *Preparation for lecturers using PRS*

It is important that lecturers using PRS for the first time should have sufficient technical support (and well thought out arrangements for handset distribution and collection). A lecturer will benefit from watching another lecturer using PRS (see also Appendix 1).

From the comments from students on different courses, we identified benefits and problems of using handsets in lectures. Students in some classes helped us identify which of these were the most important, and these should be addressed by lecturers using, or intending to use handsets. These problems/benefits may vary with class size.

### *Preparing students for using PRS*

An instruction sheet was prepared by Steve Draper for lecturers using PRS for the first time. Appendix 2. It emphasises the importance of demonstrating handset use with the students to ensure that students can quickly recognise their vote being recorded (handset numbers are colour coded) and thus to ensure that all votes are recorded. This also gives a measure of the voting strength and avoids time wasting during the lecture.

It is important to make sure the students understand the question and the answers that are provided. This is especially true when the answers include answers which are a combination of several different answers. (e.g. answers 1-4 plus some combinations such as answers 1 & 2; 3& 4 etc.

Sometimes students may find that they feel several answers are relevant. It is important to take account of this when designing the question and allow them to vote for a combination of answers, or, when for instance, voting for "benefits" of something, perhaps vote for the most important benefit and then vote again for a second benefit.

Although PRS enables the lecturer to ask unplanned questions, it is important that a significant number of the questions are well thought out otherwise the students have been shown to think that "sometimes the lecturer seems to be asking questions just for the sake of it". If the lecturer discusses the answers and the votes recorded, students are more likely to realise the benefits of using the system. (see also Appendix 3)

### ***Factors which affected the students' view of the use of PRS***

Additional personnel involved in PRS can be a distraction (especially in small classes)

Also in classes where problems were encountered with setting up the system then students were more likely to be unenthusiastic about the use of PRS.

One student reported that if the student was fixing the PRS system, she tended find herself watching him instead of listening to the lecturer.

In one module (Psychology level 4 HCI module:2 hour lectures) the students were very negative about the use of PRS. (41% more disadvantage than benefit; 12% definite negative net value) Handsets had been used in 8 lectures and a number of problems had been encountered:

Lecture 1:time wasted: student assistant had difficulty setting up PRS (20 minutes)

Lecture 2: time wasted: Data projector not working; time wasted before this was discovered; eventually obtained a portable data projector

Lecture 3: time wasted: people practising setting up PRS took too long (15 mins.)

Lecture 4:Distraction: No problems setting up but additional PRS software was being tested on a second laptop.

Lecture 8: time wasted: 30minutes before PRS was working

In some lectures the lecturer not really discuss the results of the vote. However in lectures where he did discuss the voting, students at these lectures reported informally that using PRS had been useful.

In the evaluation of the PRS system on this module, when students were given a choice of 9 possible problems with using PRS (suggested by students on other courses) 47% of the class voted "Sometimes the lecturer seems to be asking questions just for the sake of it" and 18% voted "Main focus of lecture seems to be on handset use and not on course content". Only 6% however, voted that there were "No benefits".

Some of the same students were also members of a class which took the Education module where the lecturer was the same and handsets were also used, but few problems were encountered except at the last lecture when the evaluation was carried out. At this lecture, 3 student assistants were being trained and there were problems setting it up. In this case the voting figures for the evaluation were more positive with only 12% voting "more disadvantage than benefit" and 0% voting "definite negative net value"

When these students were given the choice of 9 possible problems with using PRS (suggested by students on other courses) 32% of the class voted "Main focus of lecture seems to be on handset use and not on course content" and only 8% of the class voted "Sometimes the lecturer seems to be asking questions just for the sake of it"

From observations of the lectures on both modules it was apparent that in general the questions asked on the education module were more relevant to the course material than some on the HCI module. Also, on the HCI module sometimes the PRS was only used once after the students had experienced a significant amount of time wasted setting up the system.

From these two modules it is apparent that handsets may not be used effectively by the same lecturer in all situations. The use may well be affected by technical problems as well as by the preparation of the questions and the use made of the voting figures.

***PRS: What works/Doesn't work***

This may vary with large and small classes.

**What Works**

8. Lecturer has to know why he/she is using PRS
1. Efficient set up of equipment before lecture.
2. Training students in use of handsets.
3. Ensure that the students can see both the question and the possible answers
  - The lecturer should discuss the voting results when the charts appear.
 

This helps the students realise the point of PRS. Lets them learn from the discussion of right and wrong answers, allows them to see how they are doing in relation to the rest of the class. Students are more likely to realise that the lecturer will act on the results. On some occasions the lecturer may want to ask several questions before discussing the answers. If ask 2 questions the charts can then be shown simultaneously and compared.
4. Use of PRS to promote discussion. Ask a question/give students a problem to work out: vote: discuss answers with neighbours: vote again.
3. Allow students to vote as soon as they have worked out the answer to a problem. As some finish before others this spreads out the voting and saves time.
2. Use of PRS for training in multiple choice questions. (immediate feedback to students)

**What Doesn't Work**

5. When lecturer does not leave chart up long enough for students to take in the results (even if he/she does not discuss them) (Phil. L1, Psy L4 HCI)
  - If have too many technical problems: equipment faulty, inexperienced helpers. (Phil. L1, Psy L4 HCI)
  - Problems using PRS: Problems connecting to the projector. Tried turning the computer off and starting up again. (This worked) It is advised to connect everything before switching on the computer.
  - A lecturer using PRS did not listen when told the PRS boxes could be projected onto a different screen from the slides relating to the Question. Students were therefore unable to see all the possible answers clearly.
4. Negative attitude: Only one lecturer of the 3 involved in a 2 hour lecture used PRS. One who did not use it was very negative about PRS when speaking to students.

***Examples of types of questions asked via PRS***

*Level 1 Computing Science (from 9/1/02)*

*Study skills*

1. Problem solving techniques: "Which of the following steps in the problem solving process do you think is important?"
 

6 choices including "something else" and "don't know"
2. Lecturer asked students to chat to neighbour and think why "looking back on what did" is important. Asked students if they looked back afterwards, what did they gain?
 

Put up 10 "blank answers (via powerpoint PRS). Asked students for "benefits of "looking back". Got 5 suggestions. Lecturer added an additional answer and "none of these' & "all of these".

Asked: "Which of these benefits have you gained?" 8 poss. answers; 90 voted. (1 minute)

Lecturer emphasised that he wanted to show students what they could gain by using this technique. It allowed him to discuss study techniques and encourage students to learn how to reflect.

N.B. Some students probably gained several of these benefits when "looking back", but could only vote for one, all or none. No way to vote for 2 or 3 benefits for example.

*Level 3 Medicine*

*Multiple choice questions for formative evaluation*

The lecturer used the system on three occasions with the same class with 113-176 students.

The lecturer used the system for formative assessment giving the students a series of multiple choice questions e.g. The students were given a description of a patient's symptoms; they were then given 10 possible diagnosis or 10 possible tests which could be carried out. They then voted for what they considered was the correct diagnosis/test. If there was no consensus the lecturer asked them to discuss it and vote again. During the third use of PRS she repeated some questions which she had asked in session 1.

### Use of the same questions by Dr Allison Level 3 Medics

Question	Correct Answer	Approx % vote	
		20/2/02	18/12/02
Famous people: Match illness to person	<b>3✓</b>	<b>78%</b>	<b>80%</b>

### Heart Murmurs

Approximate percentages are given for the 2 answers with the highest vote at each session. Number of students in lecture theatre is given: most had their votes recorded. Correct answer is shown in bold.

Question	Answer Correct answer in bold.	Approx % vote				
		12/12/02	12/12/02 re-vote after discussion	20/2/02	1/5/02	18/12/02
Heart Murmurs		112 students		140 students	204 students	189 students
Q 1	3	35	10		10	
	<b>4 ✓</b>	<b>43</b>	<b>90</b>		<b>80</b>	<b>60</b>
	5					25
Q 2	<b>1✓</b>	<b>70</b>			<b>90</b>	<b>70</b>
	2	<10				15
Q 3	<b>2✓</b>	<b>20</b>	<b>40</b>		<b>32</b>	<b>30</b>
	3	62	48		44	
	5					34

*Students still have problems with Q.3.*

Students answered the evaluation questions after the 2nd and 3rd lectures. 51% (lecture 2) and 65% (lecture 3) voted "definitely benefited and 38% (lecture 2) and 24% (lecture 3) voted "benefits outweigh any disadvantages".

### Level 2 Philosophy

#### *Identification of problem areas (which can lead to adaptation in teaching)*

Students were asked to vote on their understanding of each of 10 rules of Logic. The lecturer was thus able to identify those which were causing the greatest problems (which were not those she thought students would find hard) and spend extra time working on these with the students. Students were asked to vote on each rule: dead easy: difficult but I am getting there: dastardly.

### Other Examples of Questions used in Logic

1. If the options for the next stage in this proof are MPP or MTT, which one would you choose?  
Press 1 for MPP. Press 2 for MTT.
2. Do you understand this proof?  
Yes: 2. No 1

3. What kind of statement is this?
  1. Tautology: 2. Contingency: 3. Inconsistency
4. Asked a question requiring a "verbal answer".  
Then asked class if they agreed or disagreed.
  1. Agree: 2. Disagree

### *Level 2 IBLS (biology)*

*Prelab tutorial session with about 100 students in each sitting.*

Slides of photomicrographs were displayed using a slide projector. Multiple choice questions were displayed using an overhead projector. The students were asked questions on each of the photomicrographs and then we displayed their responses and the lecturer discussed the answers

## **Methods used in the evaluation**

The following methods have been employed in the evaluation to date.

1. Observation of lectures with and in some instances, without the use of handsets. (Philosophy, Psychology, Computing Science, Medicine, Vet school, Dental Hospital: I was not present at the 2 lectures in IBLS)
2. Informal discussions with students who had used handsets in their lectures/formative assessment sessions.
3. Use of the handsets to evaluate the use of handsets in lectures re usefulness and benefits/disadvantages. We now have 2 OHP slides which can be used by the evaluator or lecturer at the end of a session to get immediate feedback on handset use.
4. Written comments from students after using handsets in lectures.
5. Questionnaires in Philosophy level 1 and level 2 which were designed to evaluate the use and usefulness of the learning resources available to the students, but which also addressed the usefulness, benefits, disadvantages and possible future use of handsets in Philosophy. This was funded by a separate contract.
6. Discussions with lecturers before and after use of handsets in their lectures.
7. Written feedback from lecturers after using handsets in their lectures.
8. Observation of the use of handsets in an engineering class at Strathclyde University.
9. Attendance at a demonstration of handset use by two lecturers at Strathclyde University
10. Involvement in, and observation of the use of handsets at a meeting of Philosophers in Leeds.

## **Specific Results from more detailed evaluation in Computing Science, Psychology and Philosophy**

### ***Evaluation in Computing Science: Level 1***

Students in both lecture theatres were asked by the lecturer to report benefits and problems with the use of PRS. The students were then asked to vote on the importance of each benefit/problem in turn.

#### **Benefits**

##### **Boyd Orr LT (paper voting)**

- Q. 7: Benefit: Gives you an idea of how well everyone else is doing.  
 Q. 8: Benefit: Makes the lecture more interesting and interactive.  
 Q. 9: Benefit: Checks whether you are understanding it as well as you think you are.  
 Q. 11: Benefit: Allows you to answer without others knowing.

##### **Maths LT (paper voting)**

- Q. 7: Benefit: See how others are getting on.  
 Q. 8: Benefit: Gives a break in the lecture.  
 Q. 9: Benefit: Allows lecturers and students to identify problem areas.  
 Q. 10: Benefit: Other people don't know how you answer.

### **Most important /greatest benefit Level 1 Computing Science**

In Boyd Orr Lecture Theatre: Checks whether you are understanding it as well as you think you are. (70 % voted very/extremely important)

In Maths Lecture Theatre: Allows lecturers and students to identify problem areas. (73 % voted very/extremely important)

### **Problems**

#### **Boyd Orr LT (paper voting)**

Q. 10: Problem: Sometimes seems to be asking questions just for the sake of it.

Q. 12: Problem: The answer the lecturer gets appears to be for the benefit of future students not us.

Q. 13: Problem: Evaluates your progress, not testing knowledge.

#### **Maths LT (paper voting)**

Q. 11: Problem: Too much time spent on PRS instead of on new material.

Q. 12: Problem: There may be many correct answers

*NB This is done for a reason. Lecturer said he has most fun with these as they stimulate discussion.*

*Lecturer discussed the problem in a number of courses where too much new material is given without checking if students are understanding. H.E. should teach you to inquire and analyse what you are doing.)*

Q. 13: Problem: It is possible that it is not anonymous (It isn't)

### **Most important /greatest problem Level 1 Computing Science**

Less than 50% considered any of these problems Important + very important (in BO LT or in M LT)

Most important problem (in BO LT):

Q. 10: Problem: Sometimes seems to be asking questions just for the sake of it. (46% voted important/very important)

Most important problem in M LT

Q. 12: Problem: There may be many correct answers (47% voted important/very important)

Least important problems in BO LT was:

Q. 12: Problem: The answer the lecturer gets appears to be for the benefit of future students not us.

Least important problems in M LT were:

Q. 13: Problem: It is possible that it is not anonymous (It isn't)

Q. 11: Problem: Too much time spent on PRS instead of on new material.

## **Evaluation in Psychology Level 4: HCI and Education Modules**

### ***Some benefits and problems collected from students***

From the comments from students on different courses (including those studying Logic), we identified the following suggested benefits and problems of using handsets in lectures. Students in some classes have helped us identify which of these are most important, and these should be addressed by lecturers using, or intending to use, handsets.

### **Benefits**

1. Using handsets is fun and breaks up the lecture.
2. Makes lectures more interactive/ interesting and involves the whole class.
3. I like the ability to contribute opinion to the lecture and it lets me see what others think about it too.
4. The anonymity allows students to answer without embarrassing themselves.
5. Gives me an idea of how I am doing in relation to rest of class.
6. Checks whether you are understanding it as well as you think you are.
7. Allows problem areas to be identified.
8. Lecturers can change what they do depending on what students are finding difficult.
9. Gives a measure of how well the lecturer is putting the ideas across.

### Problems

1. Setting up and use of handsets takes up too much time in lectures.
2. Can distract from the learning point entirely.
3. Sometimes it is not clear what I am supposed to be voting for.
4. Main focus of lecture seems to be on handset use and not on course content.
5. The questions sometimes seem to be for the benefit of the lecturer and future students and not us.
6. Annoying students who persist in pressing their buttons and cause problems for people trying to make an initial vote.
7. Not completely anonymous in some situations.
8. Some students could vote randomly and mislead the lecturer.
9. Sometimes the lecturer seems to be asking questions just for the sake of it.

### Most important /greatest benefit Level 4 Psychology

- HCI module: Checks whether you are understanding it as well as you think you are. (29%)
- Education Module: The anonymity allows students to answer without embarrassing themselves. 24%

### Least important benefit Level 4 Psychology

- HCI module: Using handsets is fun and breaks up the lecture. (35%)
- Education Module: Gives me an idea of how I am doing in relation to rest of class. (24%)

### Most important /greatest problem Level 4 Psychology

- HCI module: Sometimes the lecturer seems to be asking questions just for the sake of it. (47%)
- Education Module: Main focus of lecture seems to be on handset use and not on course content. (32%)

### Least important problem Level 4 Psychology

- HCI module: Annoying students who persist in pressing their buttons and cause problems for people trying to make an initial vote. (53%)
- Education Module: Annoying students who persist in pressing their buttons and cause problems for people trying to make an initial vote. (48%)

### *Working out problems in lecture: Benefits of PRS*

Students in both Computing Science Level 1 lecture Theatres and students studying Level 2 Logic (Philosophy) were asked about the likelihood of their actually working out the answer to a problem set to do during a lecture:

*Question: Looking back over the course, when you were given a problem to work out in a lecture or were asked for an opinion, were you more likely to try to work out the answer if:*

In BO-LT and in M LT more students with handsets than without handsets always try to work out an answer.

BO LT 24%: 14%                      M LT 31%:17%

In M LT more students without handsets never try to work out an answer. In BO LT the percentage was similar.

Students with and without handsets in the BO were more likely to try to work out the answer if handsets were used. Those in the M LT without handsets appeared more likely to try to work out an answer if handsets were involved than those with handsets.



Question	% of students who voted for each option		
	2002 LT 1	2002 LT 2	Logic L2
Given a problem to work out in a lecture, were you more likely to work out the answer if:			
<b>Response Option</b>	219 students	51 students	60
The class was asked for a verbal response to the question	3.7	0.0	0%
The class was asked to vote on one or more answers using "hands up"	1.8	7.8	2%
The class was asked to vote on one or more answers using the handsets	32.4	15.7	32%
None of the above (i.e. I never try to work out an answer)	4.1	5.9	6%
All of the above (i.e. I always try to work out an answer)	20.6	21.6	28%
"Verbal" and "Hands up" but not "Handsets"	1.8	2.0	2%
"Verbal" and "Handsets" but not "Hands up")	7.3	3.9	4%
"Hands up" and "Handsets" but not "Verbal"	25.1	35.3	26%
No answer	3.2	7.9	0%

Such results can be interpreted as the students enjoying the interactive nature of the lectures, with their responses providing us with an overwhelming endorsement of the use of handsets to engage students and keep their attention.

### ***Feedback from six lecturers who had used the PRS Handsets in their lectures***

1. The essential feature of the use of this equipment is that both students and lecturer get to know the distribution of responses and, in confidence, how their own response relates to that. The element of anonymity encourages everyone to contribute and, unlike in face to face groups, each individual can express the choice they incline to, rather than the choice they would feel able to explain and justify to others.

I have been using this equipment in an Introductory Logic course with a class of about one hundred students, and intend to use it in the forthcoming term with a Introductory Philosophy of Mind course. There have been two noticeable results so far. The first is that, if the students are to answer the questions in a way that will be helpful to them, they have to reflect more on what they have learnt and how they are learning. The second is that my teaching is being directed more by what the students need, or at least, say they need, rather than what I think they need. This means that I am not second-guessing or making unwarranted assumptions about their progress.

2. I found the handsets very beneficial in my lecture and speaking with some students afterwards they also appreciated it. In the 3rd year I have asked questions by way of a written test, and they hand it in to me at the end. They mark it during the lecture, so get to see where they have gone wrong, but I don't until later - so I can't modify the lecture instantly, only for the next year. With the handsets I could see exactly which points I had not conveyed clearly and could rectify it straight away, the major example being when I asked the students what I thought was a simple question - identifying the FCoV carrier cat! Although most (68%) got it right, but an astonishing number chose one of the other cats. I could see that they hadn't fully understood that many antibody positive cats are not infected. It was great,

because the students who got the wrong answer are very likely the same ones who never utter a word in interactive lectures and it gave them a chance to participate anonymously.

I wish I could use handsets at all my lectures - is that ever a possibility?

3. The feeling was that the idea worked well, but that the time it took with a large group was too long. This meant that students lost the thread. The group that we had were generally very good, polite and responsive and some of those that we have lectured to in previous years might have been more difficult to keep in order.

Our general conclusion was that the system would work well for groups up to about 50 in number, but for a group of this size a set up with buttons that responded instantaneously would be required. When it starts to be installed as a feature of this type in lecture rooms we will use it. We will think about using it for some update courses that we give that have about 50 participants.

4. I think (and the results also showed this) that the students liked both the experience and the fact that they could test their understanding of the topics as they went along.

The results of their tests gave me some idea of how they had understood the concepts, and if it had been obvious that they were not following what was going on, it would have allowed me to reprise the previous section (as it was I didn't have to do this). It also gave me some information that will help me to plump up the slides on the web to include extra, helpful information. As far as the technical side is concerned, I found it extremely easy to use, especially the PRS interface with Powerpoint. The Chemistry Lecture Theatre is certainly not ideal for testing new technology but I think the system stood up to it very well. Even when we were delayed in getting the equipment to the hall, the set up time did not encroach too much on the lecture.

In total I think it was a worthwhile experience, both for me and for the students. I would recommend it to others, and I would use it again.

5. I used the handsets in a level 4 option class in social psychology. The class size is about 50. The use of the sets is easy. A slight problem is the time it takes to register the students' answers and you have to time this into the lecture. The students on the other hand do not mind the delay. The consumer report indicates (informally) that they enjoy the use of the device. From the staff point of view getting the level of the questions right takes time and experience. My questions were too easy (or else I explain things very well). What I notice as a social psychologist is that there is a level of group effect to be seen as the scores come up. People do not feel individually exposed because the replies are anonymous but they do watch the distribution of answers as it appears on the screen. That by itself may be a learning experience as they then consider other possible answers. I would need then to decide what to do when the students are having difficulties. I would need a plan B which would involve a fuller explanation. So it would affect the way I plan lectures. But why not?

6. We used the handsets for a prelab tutorial session with about 100 students in each sitting. Slides of photomicrographs were displayed using a slide projector. Multiple choice questions were displayed using an overhead projector. The students were asked questions on each of the photomicrographs and then we displayed their responses and Rob went through the correct answers. I felt the session went well although we definitely needed two people to cope with the slides, overheads and the computer. It was also a bit hectic handing out the handsets and a handout at the same time. All the students that I have been able to ask, enjoyed the session and several commented on how they felt it was useful in finding out how much they knew (without me prompting such a response). Yes I think we would consider using it again, perhaps for a revision session when we could go over their class test. I think the system also has potential for monitoring lecture attendances which seems to be getting more and more of a problem.

### ***Feedback from Students***

After each session or series of sessions we now ask students to answer the following question using their handsets: In addition they are sometimes asked to give written comments.

### **Biology Level 2: Prelab tutorial session: handsets with slides**

1. Made sure that you paid attention since you would have to submit an answer, also helped see how well you were doing compared to rest of group.
2. Being able to experience what the assessment was going to be like beforehand which allowed concentration on the assessment instead of its format.
3. Able to see what the majority of other students had picked which could help the lecturers i.e. if a lot of people went for the same wrong answer also you got told the answer and an explanation which helped clear up any misunderstandings.

### ***Logic Level 2***

To see how students are coping with what's being taught. Performed in a discrete way.

-Students: Know how I am doing compared to other students. Interesting. Lecturer: Indication of students' gaps, not what lecturer thinks might be gaps.

Gives idea of your place in the class. Test progress of whole class.

Students: encourages us to participate; more likely we will be forced to listen this way. Lecturer: Let's her know what we do and don't understand.

I didn't find them very useful except to find out what I was getting wrong on a couple of occasions.

The anonymity allows the student to show he/she is unsure of the subject without embarrassing themselves.

Lecturer can gauge their method of instruction and ensure all students are absorbing the subject matter.

It takes quite a long time to get any results.

Students: Can distract from the learning point entirely. Lecturer: Has to be able to give clear instructions on what I am voting for.

Can be a bit time consuming setting it all up.

### ***Evaluation question asked of Most Classes using PRS***

What was, for you, the balance of benefit vs. disadvantage from the use of the handsets in your lectures?

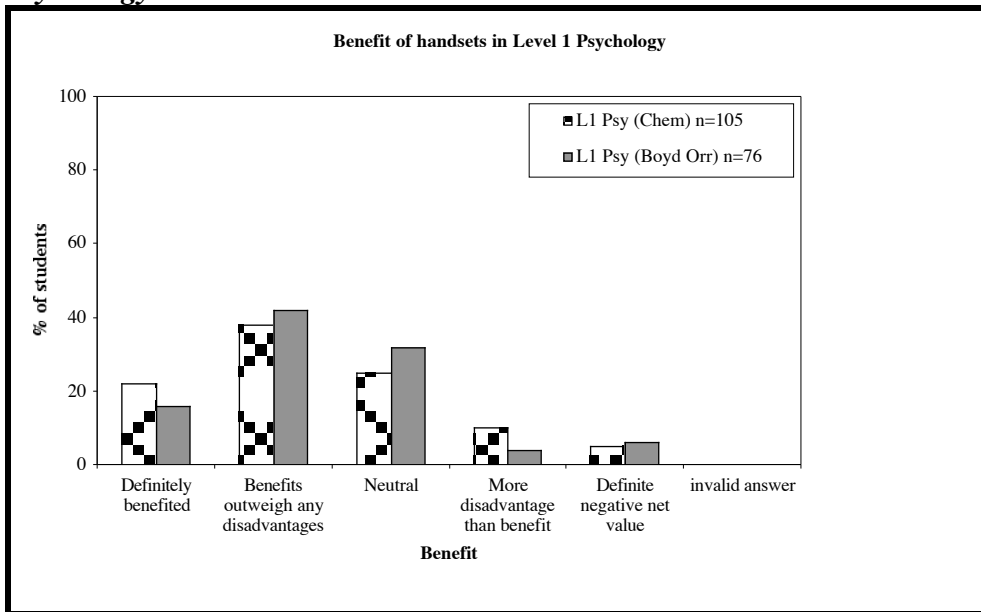
1. Definitely benefited
2. Benefits outweigh any disadvantages
3. Neutral
4. More disadvantage than benefit
5. Definite negative net value

NB Some asked

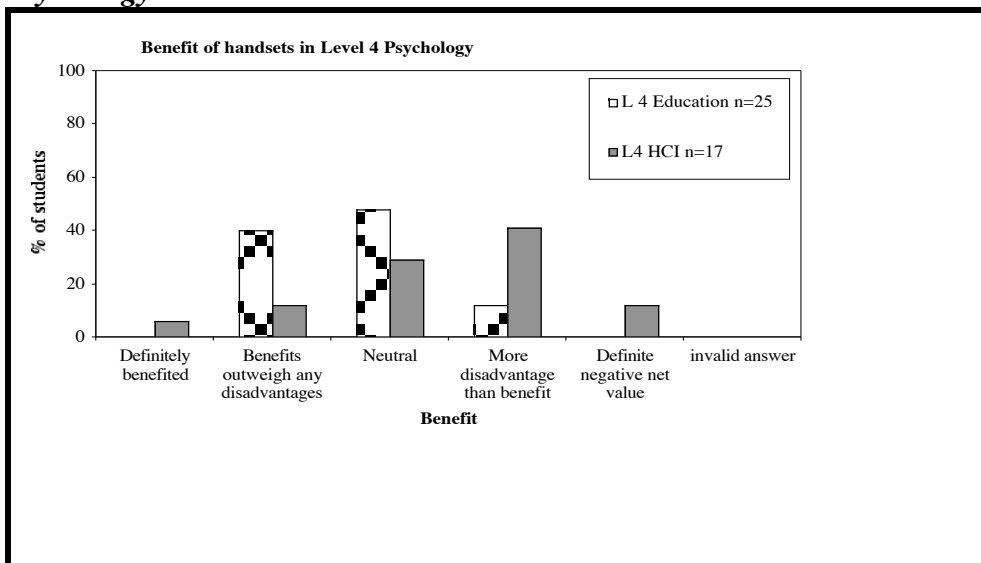
1. Extremely useful
2. Very useful
3. Useful
4. Not very useful
5. Not at all useful

**Results of this question**

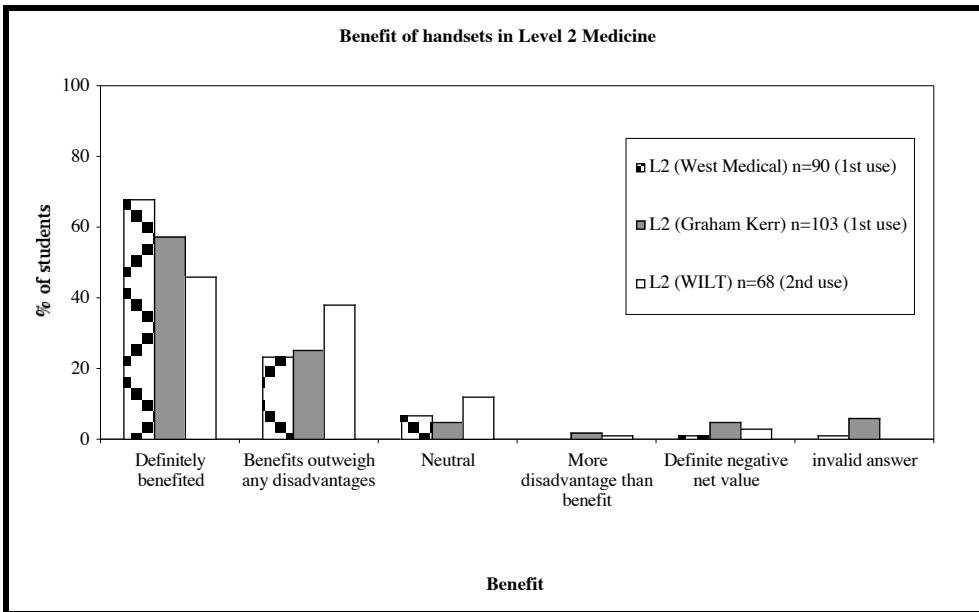
**1 Benefit Psychology**



**Psychology**



**IBLS**



**2 Usefulness**

