



Improving the Quality of Education: from remembering to understanding

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**What do we know about
how people learn?**

How can we exploit this knowledge to
promote more effective learning?

What do we want students to be able to do when their education is finished?

• Do we want them to be able to remember information?

[Write answers in an exam]

• Or do we want them to be able to do things?

Ways of teaching: ways of encouraging learning

- Lectures
- Small group sessions
- Laboratory practical classes
- Self-directed learning/internet
- Problem-based learning
- Others . . .

Ways of teaching: ways of encouraging learning

For each of these - how do we assess the quality of the teaching?

- Lectures
- Small group sessions
- Laboratory practical classes
- Self-directed learning/internet
- Problem-based learning
- Others . . .

Quality Lectures

What can be done?

- Training of new lecturers
- Peer observation of teaching
- Understanding how people learn
- Helping students to learn

Quality Lectures

Understanding how people learn

What can we do about attention span in a traditional lecture?

- *Make a break*
- *Change of pace*
- *Audiovisual aid*

Quality Lectures

(1) Verbal (information)

Quality Lectures

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(2) Extraverbal (hand-shaking)

Quality Lectures

(1) Verbal (information)

(2) Extraverbal (hand-shaking)

(3) Non-verbal (body language)

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(3) Non-verbal (body language)

(4) Audio-visual aids

Quality Lectures

(1) Verbal (information)

(2) Extraverbal (hand-shaking)

(3) Non-verbal (body language)

(4) Audio-visual aids

Short-term memory

(processing?, incorporation?)

Quality Lectures

(1) Verbal (**information**)

(2) Extraverbal (hand-shaking)

(3) Non-verbal (body language)

(4) Audio-visual aids

Short-term memory

Long-term memory (**useable**)

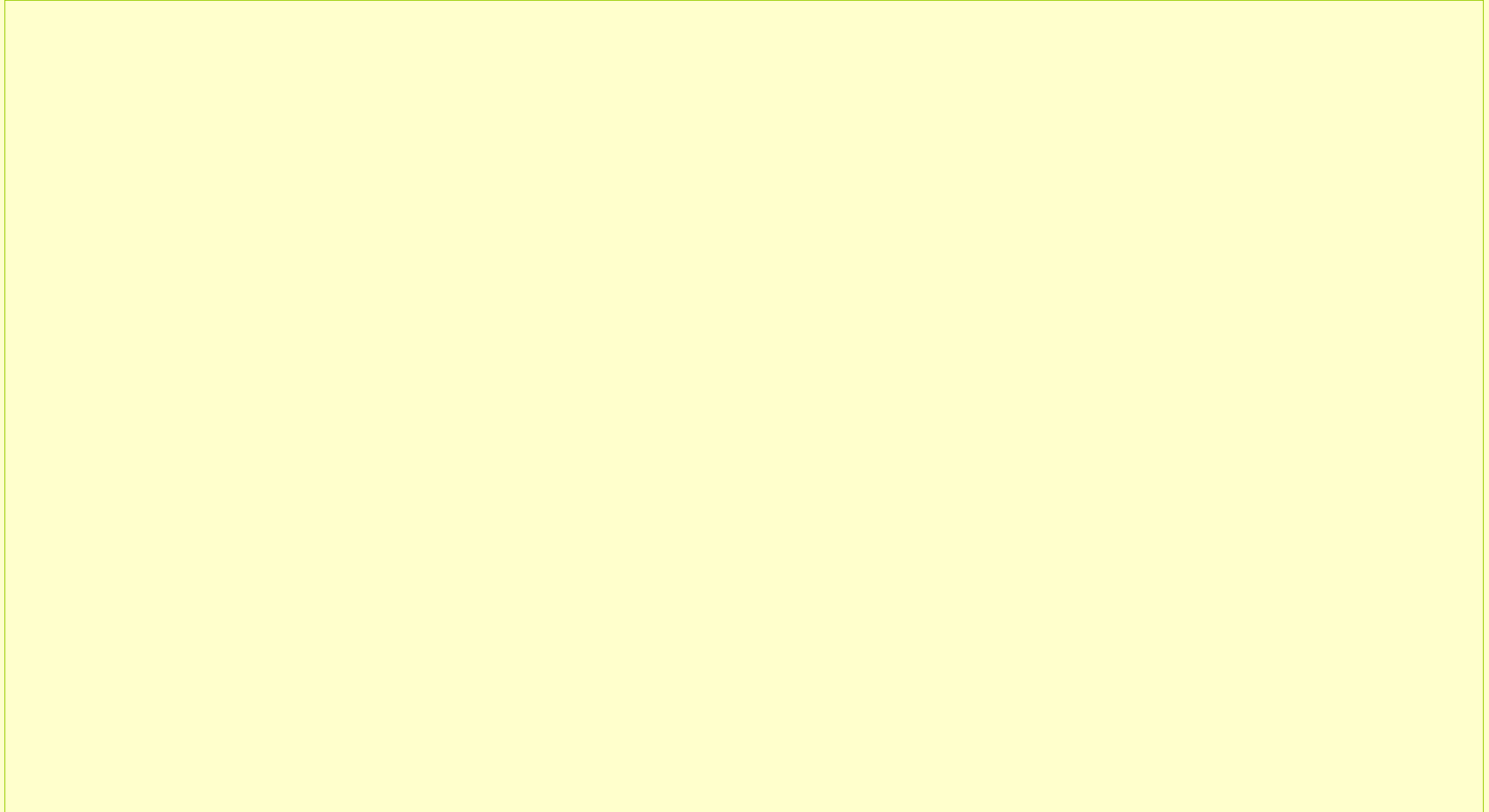
Quality Lectures

Understanding how people learn

How students learn:

- Short term memory
- Long term memory
- Shallow learning
- Deep learning
- Strategic learning

Quality Small group teaching



Quality Small group teaching

Factors involved:

- Size of group
 - Ability of group leader
 - Group psychology
 - Giving time for student questions
 - Getting all students involved
-

Quality Small group teaching

Problem-based learning

Problem posed (leader is facilitator)

Students discuss, re-formulate

Decide what information is needed,
find information

Bring information to the group

Discuss possible solutions

Reflect on the process

Quality laboratory teaching



Quality laboratory teaching

Different skills being learned:

- Manual skills
- Knowledge about instruments
- Designing experiments
- Recording data
- Reaching conclusions

Quality laboratory teaching

Teaching and checking these skills very different from examinations:

- Teacher's experience
- Testing competence
- Individual assessment
- **NOT** just writing lab reports

The learning pyramid

*Retention of knowledge
after:*

*Typical
retention:*

Lecture

5%

Reading

10%

Audio-visual

20%

Demonstration

30%

Discussion group

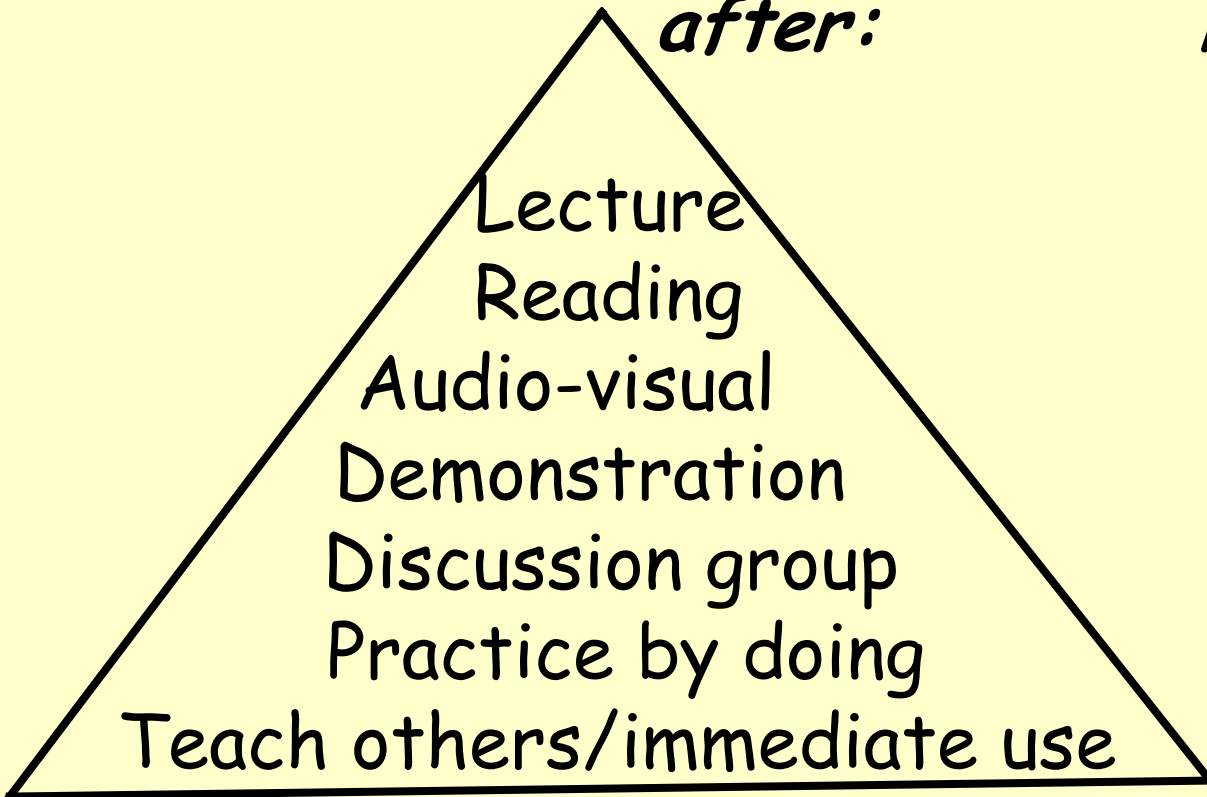
50%

Practice by doing

75%

Teach others/immediate use

80%



Active learning

Learning by doing (experiential) rather than by listening or reading

More likely to remember

Have to digest (i.e. process) information

Science seen in context (connected, relevant)

Several skills learned simultaneously

Five factors that underpin successful learning

(Courtesy of Phil Race:

author: "The Lecturer's Toolkit")

Five factors that underpin successful learning

- *Wanting* –
motivation/interest/enthusiasm

Five factors that underpin successful learning

- *Wanting* – motivation/interest/enthusiasm
- *Needing* – necessity/survival/saving face

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Five factors that underpin successful learning

- *Wanting* – motivation/interest/enthusiasm
- *Needing* – necessity/survival/saving face
- *Doing* – practice/trial-and-error
- *Feedback* – other peoples' reactions/seeing the results

Five factors that underpin successful learning

Wanting – motivation/interest/enthusiasm

Needing – necessity/survival/saving face

Doing – practice/trial-and-error

Feedback – other peoples' reactions/seeing the results

Digesting – making sense of what has been learned/realizing/gaining ownership

Digesting information

- Initially “dispersed knowledge” – little integration, not easily applied to problems
- Finally “elaborated knowledge” – digested, condensed, compiled, highly organized, supports use (able to solve problems)

Conclusions (1)

There is information and research about how people learn

Teachers should understand and exploit this information in order to achieve quality teaching

Focus on OBJECTIVES - what is it we want students to be able TO DO as a result of their education

Conclusions (2)

We want students to be able to develop a number of skills — not just remembering to pass the examination

The range of skills to be developed are abilities — to be able TO DO

Students need to be prepared for a lifetime of self-education

How does the Quality of Teaching
affect Students' Learning?

*The Assessment of Teaching
Quality*

What do we mean by quality?

How can we assess teaching quality?

Some questions to ask:

- Are the aims of the course achieved?
- Is there a low drop-out rate?
- Are the graduates successful?
- Are the graduates acceptable to employers?
- Are the graduates properly trained for PhD?

Aspects of education to consider

- Content
- Delivery
- Resources
- Support for students
- Student achievement
- Assurance processes

We can ask questions about all these aspects

Six aspects of education

- 1) Curriculum design, content and organisation
- 2) Teaching, learning and assessment
- 3) Student progression and achievement
- 4) Student support and guidance
- 5) Learning resources
- 6) Quality management and enhancement

(1) Curriculum design, content and organisation

- Does the student learning experience meet the objectives of the course?
- Can the objectives set by the department be achieved by the students?
- Is the course *content* appropriate?
- Is the *level* of the course appropriate?

(1) Curriculum design, content and organisation (continued)

- Is the content of the course up to date?
- Do the teaching methods take into account recent developments in teaching and learning research and technology?
- What transferable skills are taught?
- Does the course provide for progression to further study or employment?

(2) Teaching, learning and assessment

- What are the intended learning outcomes?

How do they relate to:

- Knowledge and understanding?
- Transferable skills?
- Cognitive skills?
- Subject-specific skills (including professional skills)?

(2) Teaching, learning and assessment (continued)

What is the evidence that the teaching is satisfactory from:

- Student evaluation questionnaires?
- Teaching and learning materials?
- Class observations?
- Meetings with staff and students?
- External examiners' Reports

(3) Student progression and achievement

- What are the entry qualifications?
- Are they appropriate?
- Do all students complete the programme?
- What qualifications are awarded?
- What evidence is there that students attain the intended learning outcomes?

Student achievement

- Not just ability to pass exams!
- Quality of all work
- What do they learn?
- Skills and qualities to take to the workplace
 - Subject specific
 - Generic or transferable

(4) Student support and guidance

Is there an overall strategy for support and guidance?

Do students know what this strategy is?

What is the evidence that it is satisfactory?

Is there a tutorial system?

Is there welfare support?

Is career guidance given?

(5) Learning resources

- Is there an overall strategy for learning resources?
- Is an appropriate library available?
- Is there sufficient equipment for labs?
- Is there sufficient and up to date IT equipment?
- Is there appropriate technical support?

(6) Quality management and enhancement

- What mechanisms are in place to monitor the extent to which the objectives of the course are being met?
- What evidence is there that there are effective arrangements for evaluating the quality of the teaching, learning and assessment?

Summary

Good quality teaching encourages good quality student learning

Quality assessment is vital to ensure supply of adequately prepared graduates

Use internal mechanisms, although external checks are helpful

Assessment of quality is time-consuming and bureaucratic

