Difficult Learners: Identifying Best Instructional Practices

University of Vermont
School of Medicine
May 11, 2012

Norma S. Saks, Ed.D.
Assistant Dean for Educational Programs &
Director, Cognitive Skills Program
Associate Professor, Department of Psychiatry
Robert Wood Johnson Medical School
Objectives:

1. To provide opportunity for you to reflect on challenging medical student learners

2. To provide a framework to address issues relating to learning and performance.

3. To identify effective strategies for planning instruction and for teaching all learners, and particularly those who need special assistance.
How do we define the difficult learner?

Deficient in…

- Knowledge?

- Clinical and/or Communication Skills?

- Attitudes (Professionalism?)

- Other?
A framework to assist learners & promote lifelong, self-directed learning, & enhance reasoning skills.

The Learning Process

Acquisition, Maintenance, Proficiency

(Learning challenges & skills to be assessed and addressed.)

Connecting structured knowledge to memory, clinical reasoning, & exam performance
MEDICAL STUDENTS ARE COMPETENT LEARNERS
Why can medical school be challenging? (and how does it differ from previous education?)

- Volume
- Details
- Time Constraints
- Exams
- PATIENT CARE
1. How do medical students build a knowledge base sufficient for
   --strong exam scores?
   --excellent patient care?

2. How do faculty promote effective self-directed learning for a lifetime?
Goal of all learners:

- To become highly efficient and effective in knowledge acquisition and retention

- What knowledge/tools do we need to help/teach them?
“Learning 101”
Lessons for Lifelong Learning
At the end of this session you should be able to:

Describe the learning process, & skills necessary for learners to move successfully through acquisition, maintenance, & proficiency.

- Identify effective strategies for planning instruction & for teaching.
- Select strategies to assist learners who are challenged, including error analysis.
THE LEARNING PROCESS
STAGES OF LEARNING

Acquisition

Maintenance

Proficiency
(Mastery)
Challenges for students at Acquisition:

- **Too much material, too little time.**
  - Time management issues
  - Inefficient reading
  - Inefficient notetaking

- **Passive vs active learning**
  - Stick with undergraduate approach (linear)
  - Study alone (too much)
  - Study with group (too much)
  - Lack an accurate feeling of “knowing”
ACQUISITION

What are best instructional practices to enhance learning...

INSTRUCTION ➔ STUDENT LEARNING
Too much material, too little time.

- Provide roadmaps to help students organize the material to learn.
• What roadmaps do you provide for students?
  - Syllabi?
  - Objectives?
  - Handouts?
  - Clinical/bedside teaching?

• Do you help students make “connections”?
  - Among course topics?
  - Among courses?
  - Across disciplines?
  - Across clinical encounters?
Too much material, too little time.

- Provide roadmaps to help students organize the material to learn.
- Help students FRAME the material.
- Prioritize the material you present.
First Acquisition
First Review
Second Review
and so on...

Increasing Levels of detail
KNOWING IT ALL
• Do you help students “frame” the material they must learn? If so, how?

• Lecture:
  How do you decide what to teach in limited time?

• “Less is More”:
  • Remember to prioritize the information you present.
  • Do you present an optimal amount of information?

Reminder:
Teaching vs. Learning

  Not everything that is taught is learned.

*Are you encouraging memorization without understanding?
Too much material, too little time.

- Provide roadmaps to help students organize the material to learn.
- Help students FRAME the material.
- Prioritize the material you present.
- Encourage previewing. Provide guidance.
- Encourage active reading: Remind students to ask questions & search for answers.
- Create handouts that are conducive for notetaking. (Encourage annotating.)
Encourage Active (not passive) Learning

- Utilize interactive lecture styles. (TBL? ARS?)
- Maintain small, small groups.
- Provide opportunities for students to generate questions & seek answers in comfortable settings (e.g. small groups & office hours.)
- Include application exercises during instruction, including clinical correlations.
- Remind students to ask questions & search for answers (instead of reading “as if a novel.”)
Acquisition Issue:

How will you know when your students really know something?

How will your students know when they really know something?

Think of a familiar object.
Familiarity ≠ Knowledge

Recall vs. Recognition

Challenge: How do we encourage students to learn at a level of recall?
STAGES OF LEARNING

Acquisition

Maintenance

Proficiency

(Mastery)
Challenges for students at Maintenance:

- **Over dependence on memorization.**
  - Memorize vs “understand.”
  - Learn apart from meaningful context.
  - Depend primarily on review just before exams; neglect to build in cumulative review/spaced practice; run out of time.

- **Pay too little attention to key differences**
  - Stick with undergraduate approach (linear).
  - Neglect essential organization.
MAINTENANCE:

Best instructional methods for helping students remember…

INSTRUCTION → STUDENT LEARNING
Teach for understanding.

- Encourage students to learn in a meaningful way; to really understand.
- Provide road maps to establish new learning in context.
- Help students make connections between & among topics.
- Help students make connections between basic science & clinical medicine.
- Encourage questions.
Which “number” is more memorable?

1-800-362-8677

OR

1-800-DOCTORS
Retention: Contrast of Meaningful and Rote Materials
Emphasize Organization & Identification of “Confusing Material” & Key Differences.

- Make explicit material that is easily confused.
- Provide handouts with charts and diagrams. (Help students organize.)
- Provide practice materials (exam questions) which emphasize key differences and differentials.
- Model & be explicit when engaging in clinical reasoning during patient care.
Why is organization so important?

To demonstrate…

Exercise:

Listen….

Then write….
Why do student doctors need to build organized knowledge structures?

Knowing **differences** is essential for thinking about **differential diagnosis**: Important for “doctoring” & for exams.
Notetaking:

“Make your mind a FILE, not a pile.”
<table>
<thead>
<tr>
<th></th>
<th>Type 1 Diabetes</th>
<th>Type 2 Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of onset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic Predisposition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defect or Deficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of Ketosis</td>
<td>Common</td>
<td>Rare</td>
</tr>
<tr>
<td>Plasma Insulin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment with oral hypoglycemic drugs</td>
<td>Unresponsive</td>
<td>Responsive</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Which one of the following best describes a characteristic of newly diagnosed type II diabetes mellitus not usually present in type I diabetes mellitus?

A. Increased lipolysis in adipose
B. Hyperinsulinemia
C. Hyperglycemia
D. Ketosis
A 10-year-old girl has a fever, joint pain, and fatigue for 10 days. She also has had symptoms of an upper respiratory tract infection several times during the past 2 months. Findings include normal joints, a grade I/IV high-pitched decrescendo diastolic murmur at both the right third intercostal space and left lower sternal border, and a grade II/IV high-pitched holosystolic murmur at the apex. The MOST likely explanation for these findings is

A. Acute rheumatic fever
B. Bicuspid aortic valve
C. Complete atrioventricular canal defect
D. Purulent pericarditis
E. Viral myocarditis
Handouts:

Do your handouts help students create knowledge structures, and influence their learning?
Differences Between Nephrotic & Nephritic Syndromes

NEPHROTIC SYNDROME
- Heavy Proteinuria (>3.5g/d)
- Hypoalbuminemia
- Edema
- Hyperlipidemia

NEPHRITIC SYNDROME
- Hematuria
- Oliguria
- Azotemia
- Hypertension
| TABLE XIII: Features that distinguish ulcerative colitis from Crohn’s disease |
|------------------------|-----------------------------------------------|
| **Ulcerative Colitis** | **Crohn’s Disease**                          |
| **Part of bowel involved** | * Distal segments of large intestine are most diseased | * All parts of bowel are involved but most commonly ileum and colon. Anus may be involved. Rectum is often spared. |
| **Histology** | * Disease affects only mucosa. | * Disease may be transmural, with fissures, skip areas, fibrosis, or noncaseating granulomas. |
| | * The disease is continuous with crypt abscesses and few goblet cells. | |
| **Complications** | * Bleeding | * Fistulae |
| | * Toxic megacolon | * Fibrosis, strictures |
| | * Colon cancer | * Perforation with abscess formation |
| | | * Anal disease |
Finally…To foster retention and memory:

• Encourage students to review… cumulatively.

• Build in opportunities for integration & review of previously learned material throughout course/semester/year/multiple years.

• Test your students’ knowledge… Encourage self testing.
Cumulative Review
Spaced Practice

vs.

Massed Practice
Cumulative Review & Spaced Practice

Engaging in frequent on-going review of small units of information at regular intervals is more productive than reviewing all of the material just at one time.

What role do you/can you play?
The Learning Process: Stages of Learning

Acquisition

Maintenance

Proficiency (Mastery)
Challenges for students at Proficiency:

- **Lacks knowledge (or skill)**
  - Lacks essential background knowledge & either unaware or no time to fill in.
  - Runs out of time due to inefficient study strategies.

- **Poor test taking strategies**
  - Lacks systematic method.
    - Misreads, misunderstands, impulsive
  - Thinks about “tricks & traps” more than content.
PROFICIENCY:

Best instructional methods for helping students score better on exams & other proficiency activities?
Lacks Knowledge

- Encourage strategies for deep and durable learning, and for managing time.
- Provide supplemental materials for gaining necessary background information.
- Provide *formative assessments* at frequent intervals to enable students to assess progress toward proficiency, to encourage ongoing learning, & keeping current.
- *Formative assessments* enable faculty to adjust instruction when necessary.
Test Taking: Encourage error analysis and identification of ineffective test taking strategies.

- Provide opportunities for error analysis both for formative & summative assessments.
- Utilize information to guide students in their future learning.
- Assess the need for individualized, specific interventions e.g. academic and/or psychological counseling for “test anxiety.”
ERROR ANALYSIS*…

Students avoid:

“I didn’t know it” or “I’m just a poor test taker.”

- **Content Errors**
- **Strategy Errors**

*Becoming aware of errors helps students plan appropriate follow up.*
# Error Analysis

Exam: _____  
Score: __________

<table>
<thead>
<tr>
<th>Q #</th>
<th>Topic</th>
<th>Never Saw</th>
<th>Decided not to study</th>
<th>Learned incorrectly</th>
<th>Studied but could not recall</th>
<th>Could not apply</th>
<th>Test-Taking</th>
<th>Misread</th>
<th>Impulsive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Error Analysis

- **Content Errors**
  1. Never saw
  2. Decided not to study (Setting priorities for study)
  3. Studied but learned incorrectly
  4. Studied but could not recall

  (Note: 1, 2, & 3 related to Acquisition strategies)
  #4 related to Maintenance strategies

- **Application Errors**

- **Strategy Errors** (Test Taking)
  - Misread/Misinterpreted
  - “Impulsive”/Overconfident
## Error Analysis

**Exam: Midterm**  
**Score: ____________**

<table>
<thead>
<tr>
<th>Q #</th>
<th>Topic</th>
<th>Never Saw</th>
<th>Decide not to study</th>
<th>Learned incorrectly</th>
<th>Studied but could not recall</th>
<th>Could not apply</th>
<th>Misread</th>
<th>Impulsive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (12)</td>
<td>Student A</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (12)</td>
<td>Student B</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
INTERVENTIONS FOR CHALLENGING LEARNERS:

- **Communicate**, communicate, communicate, communicate.
- **Provide feedback**, feedback, feedback.
- **Maintain records**.
- **Set specific goals** for change & **monitor**.
- **Encourage self-reflection and self-monitoring** that can lead to changes.
INTERVENTIONS FOR CHALLENGING LEARNERS:

- What **resources** are needed?

- What **policies and support** are essential at the institution to assist learners facing challenges?