

The Implementation of an Online Family
Medicine Clerkship for the Promotion of
Evidence Based Practice:
Focused Instruction for Improving
and Sustaining Students'
Clinical Decision-Making and
Information-Retrieval Skills

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Overview

- ❑ Large, urban school of medicine
- ❑ Third year, Online Family Medicine Clerkship
- ❑ Curriculum design
- ❑ Research data

Family Medicine Clerkship

- ❑ 80% of students participate
- ❑ 3rd year of clinical rotation
- ❑ 6-week blocks
- ❑ 16 students per block
- ❑ 8 blocks per year

Traditional Clerkships Challenges

- ❑ Students geographically dispersed
- ❑ Little communication among peers and faculty
- ❑ Students isolated from campus life
- ❑ Curriculum varies from site to site

Online Family Medicine Clerkship Grant

- ❑ Robert Wood Johnson Foundation
- ❑ \$240,000
- ❑ Develop **online course** to supplement traditional clinical clerkship

Goals

- ❑ Promote reflection, mindful practice, humanism
- ❑ Teach information retrieval, use of MEDLINE
- ❑ Improve disease management skills
- ❑ Teach evidence based medicine (EBM) skills

H.E.A.L. Model of Instructional Design

Heuristic for **E**lectronic **A**synchronous **L**earning

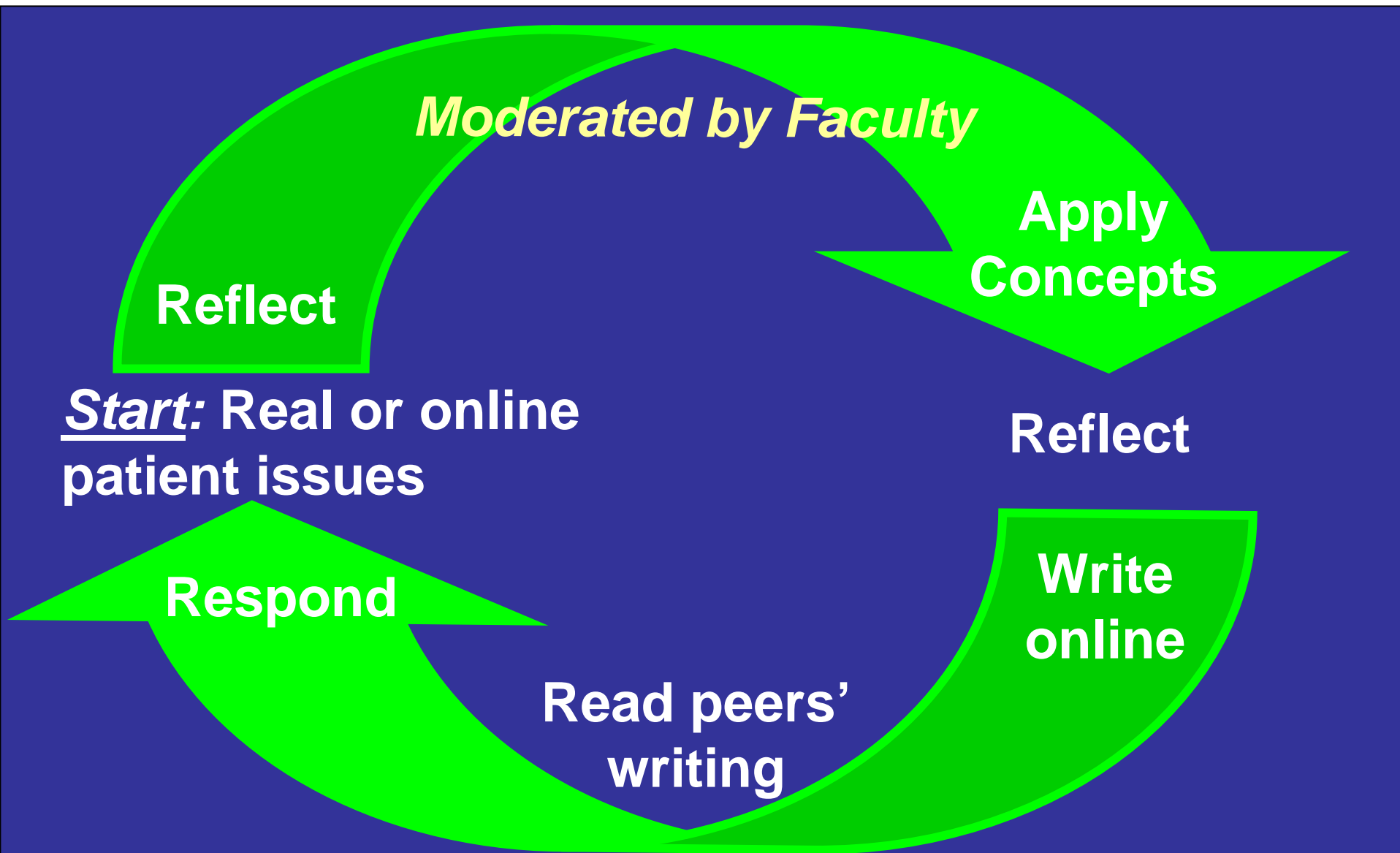
1. **Acquisition of key clinical skills**
disease management, EBM,
information retrieval
2. **Independent learning**
problem-solving, investigation, discovery
3. **Collaboration**
shared journal writing, reflection

Medical Education Called to Action

“Medical educators should exploit the potential of distance learning technology to deliver educational programs in which instruction and evaluation are of a consistent and high standard across multiple settings in the community.”

Council On Graduate Medical Education. Thirteenth Report: Physician Education for a Changing Health Care Environment. Rockville MD: U.S. Department of Health and Human Services, 1999.

H.E.A.L. Communications Model



Online Curriculum Content

- ❑ Basic MEDLINE skills tutorial
- ❑ Advanced, EBM searching tutorial
- ❑ Introduction to the AHRQ National Guideline Clearinghouse
- ❑ Training on calculating and interpreting NNT
- ❑ Opportunities to apply, reflect, discuss

Current Location: Week 2:

◀ Back



Assignments are due before Monday, November 13. This week, you will be working on the following activities in this order:

Tuesday:

Diabetes case



1. Review Maria Rivera's [first visit](#) with you
2. Post your initial impressions of Maria's case (in [Communication](#))
3. View EBM Module on [Forming Clinical Questions](#)
4. View EBM Module on [OVID Medline](#)
5. Preview the Journal topic for the week (in [Communication](#))
6. Read any new journal postings for your group (located in [Communication](#))

Thursday:

1. Complete and post your [EBM assignment](#)
2. Review the Website on [Cultural Competence](#) (located [External Links](#))
3. Add to your Journal, and comment on at least one other journal entry (in [Communication](#))
4. Participate in the *Initial Impressions* discussion on Maria Rivera (in [Communication](#))

Weekend:

1. Finish your journal work (in [Communication](#))
2. Create and post a SOAP note for Maria Rivera, using EBM postings (in [Communication](#))
3. Review the [reading](#) for this week (also in your readings book) and the [Learning Objectives](#) for the written exam.
4. Optional: Review all EBM postings (in [Communication](#))

Announcements

Course Information

Staff Information

Communication

External Links

Student Tools

BU Resources

Resources

Course Map

Search

Logout

Control Panel

Powered By

Bb
Blackboard

Research

- ❑ Evaluate new online curriculum
- ❑ Measure against traditional clinical rotation
- ❑ Assess information-retrieval and EBM practice skills
- ❑ Record feedback about students' clerkship experiences

Research Component

Control group

$n = 104$

Clinical rotation **only**

Pre- and post-surveys

Patient care skills
evaluation

Track MEDLINE usage

Intervention group

$n = 134$

Clinical rotation **plus
online curriculum**

Pre- and post-surveys

Patient care skills
evaluation

Track MEDLINE usage

Data Sources

- ❑ Pre- and post-clerkship surveys
- ❑ Tests:
 - MEDLINE searching skills
 - Critical appraisal of the literature:
selection of best articles to address a
clinical question
 - Calculation of NNT statistic

Pre- and Post-Clerkship Surveys

Skills and attitudes:

- ❑ Medical humanism
- ❑ Disease management
- ❑ MEDLINE searching skills and usage
- ❑ Value and utility of EBM
- ❑ Evaluation of clerkship experience

Research Results

Demographic Variables

Intervention and **Control** groups statistically equivalent

- ❑ Age
- ❑ Ethnicity
- ❑ Gender
- ❑ Computing skills and usage
- ❑ MCAT scores
- ❑ Grade point averages

MEDLINE Training and Research

- ❑ Online clerkship week 1:
Basic MEDLINE searching tutorial
- ❑ Online clerkship week 2:
Advanced MEDLINE and EBM searching tutorial
- ❑ Online clerkship week 6:
MEDLINE searching test

MEDLINE Literature Search Analysis

Simulated patient case:

***an aspirin-a-day for the primary prevention
of myocardial infarction***

- Analyze aspirin case
- Write clinical question
- Perform OVID MEDLINE search
- Identify 2 - 5 best articles

MEDLINE Literature Search Analysis

- ❑ OVID MEDLINE
- ❑ Individual login names & password distributed
- ❑ Searches electronically captured
- ❑ Searches blinded
- ❑ Searches expertly-evaluated by health sciences librarians

MEDLINE Search Strategy Evaluation Criteria

4 = Excellent

1 - 3 plus: Searches for randomized controlled trials or meta-analyses as a publication type

3 = good

1 - 2 plus: Any attempts to identify evidence

2 = fair

1 plus: Attempts to manipulate concepts using MeSH, subheadings, or other variables

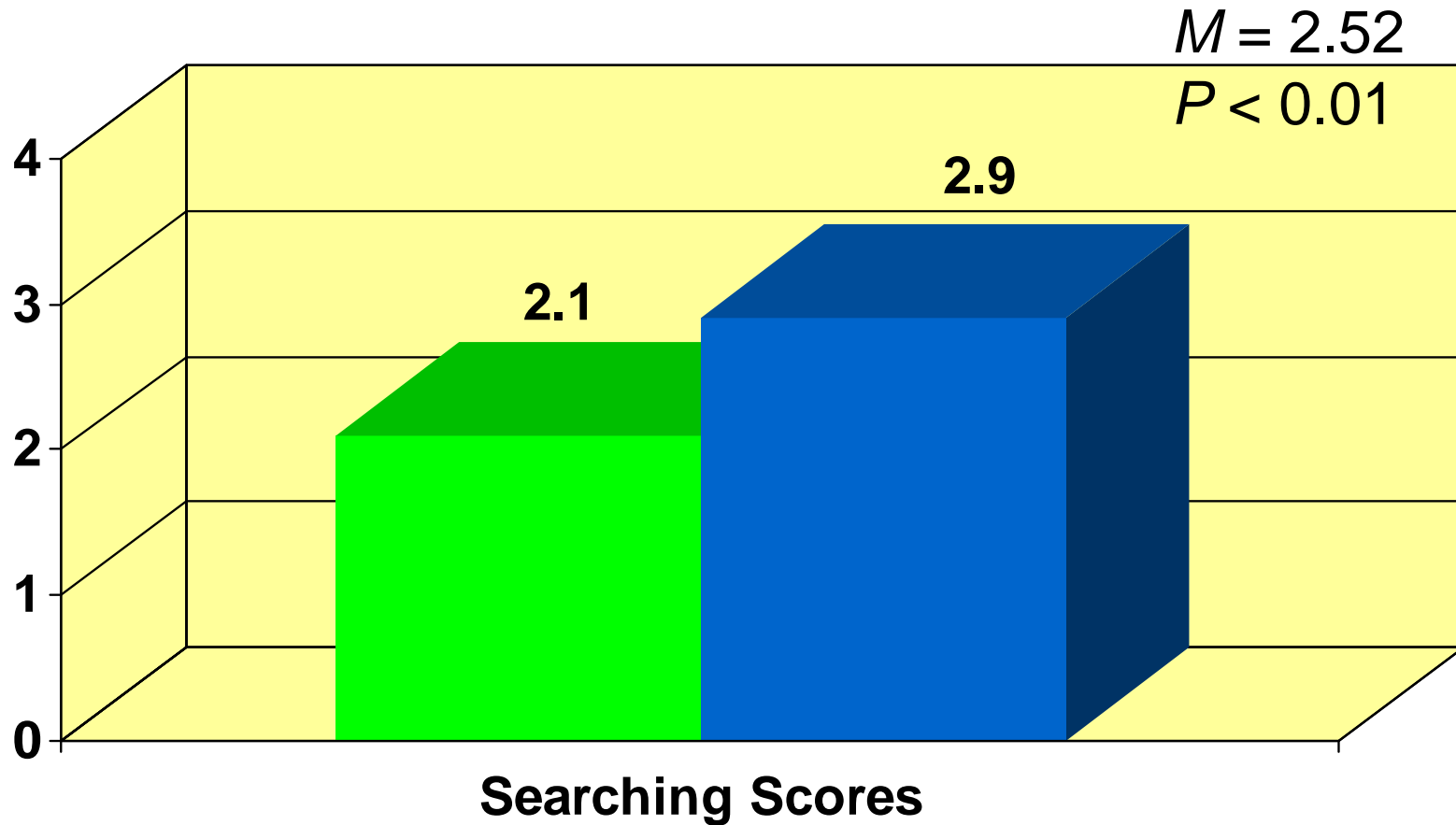
1 = poor

Minimum threshold: Attempts to identify and combine key concepts

Burrows and Tylman (1999), Wildemuth and Moore (1993, 1995), Nesbitt, et al. (2001), and Schilling (2002).

Mean Searching Scores

Scores on a 1 (poor) - 4 (excellent) scale



■ Control n = 104 ■ Intervention n = 112

Literature Searching Functions

Self-ratings on a 1 (Novice) - 5 (Expert) scale

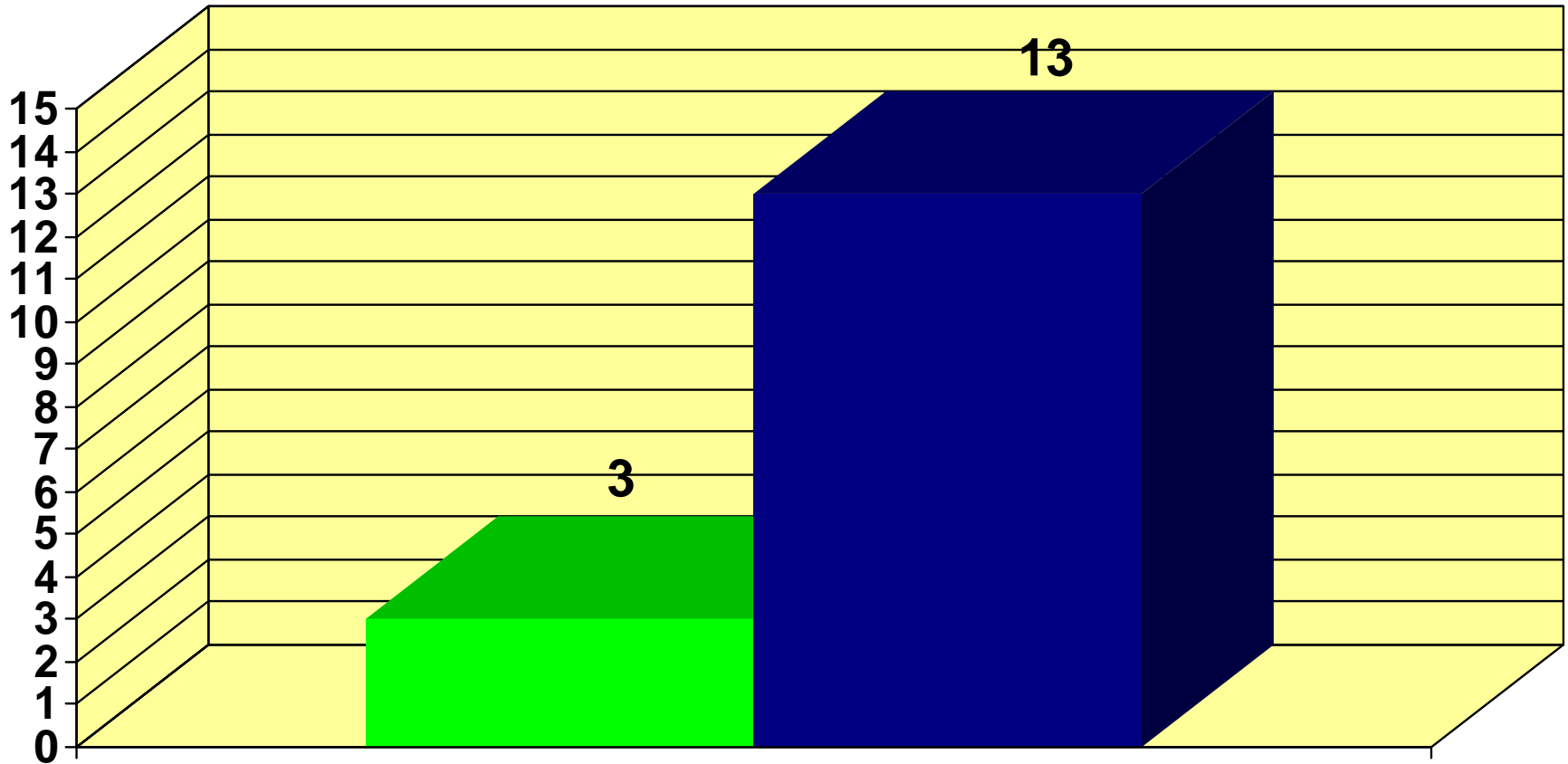
Search Function	Post- Clerkship Mean		Intervention effective?
	<u>Control</u>	<u>Intervention</u>	
Plan a search strategy	3.6	3.8	} Yes <i>P</i> < 0.01
Map	2.9	3.6	
Explode	3.0	3.7	
Focus	3.1	3.6	
Combine	3.9	4.3	
Limit	3.8	4.3	

Short- and Long-Term Analyses of MEDLINE Searching Habits

- Captured all OVID searches during 3rd year clerkship through graduation
- Use of PubMed and other systems NOT captured
- Blinded
- $N = 198$
 - Intervention $n = 88$
 - Control $n = 110$

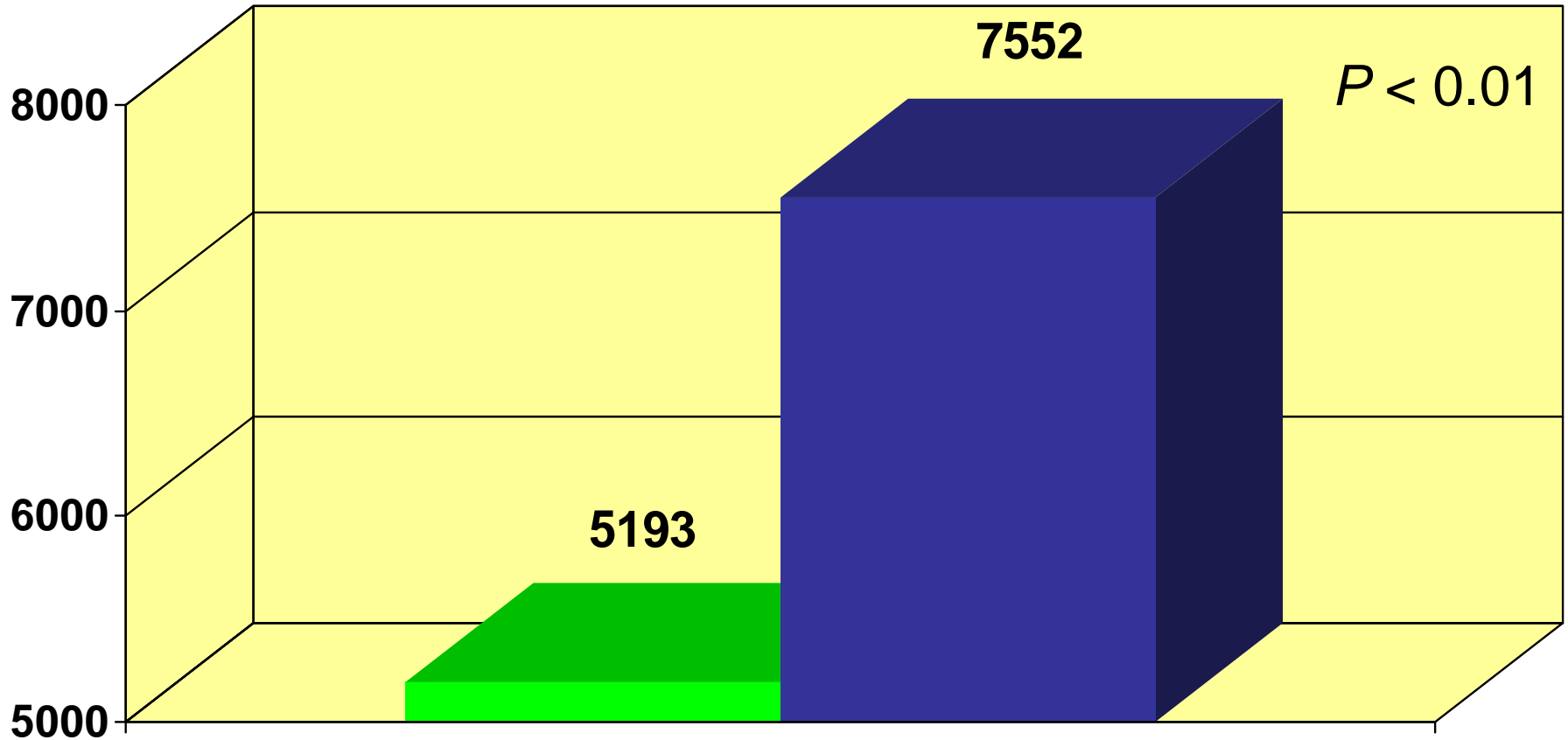
Mean Numbers of Searches Performed By Each Student During Clerkship

$P < 0.01$



■ Control n = 104 ■ Intervention n = 112

Longitudinal Results: Total Searches Performed



■ Control n = 110 ■ Intervention = 88

Article Selection Analysis

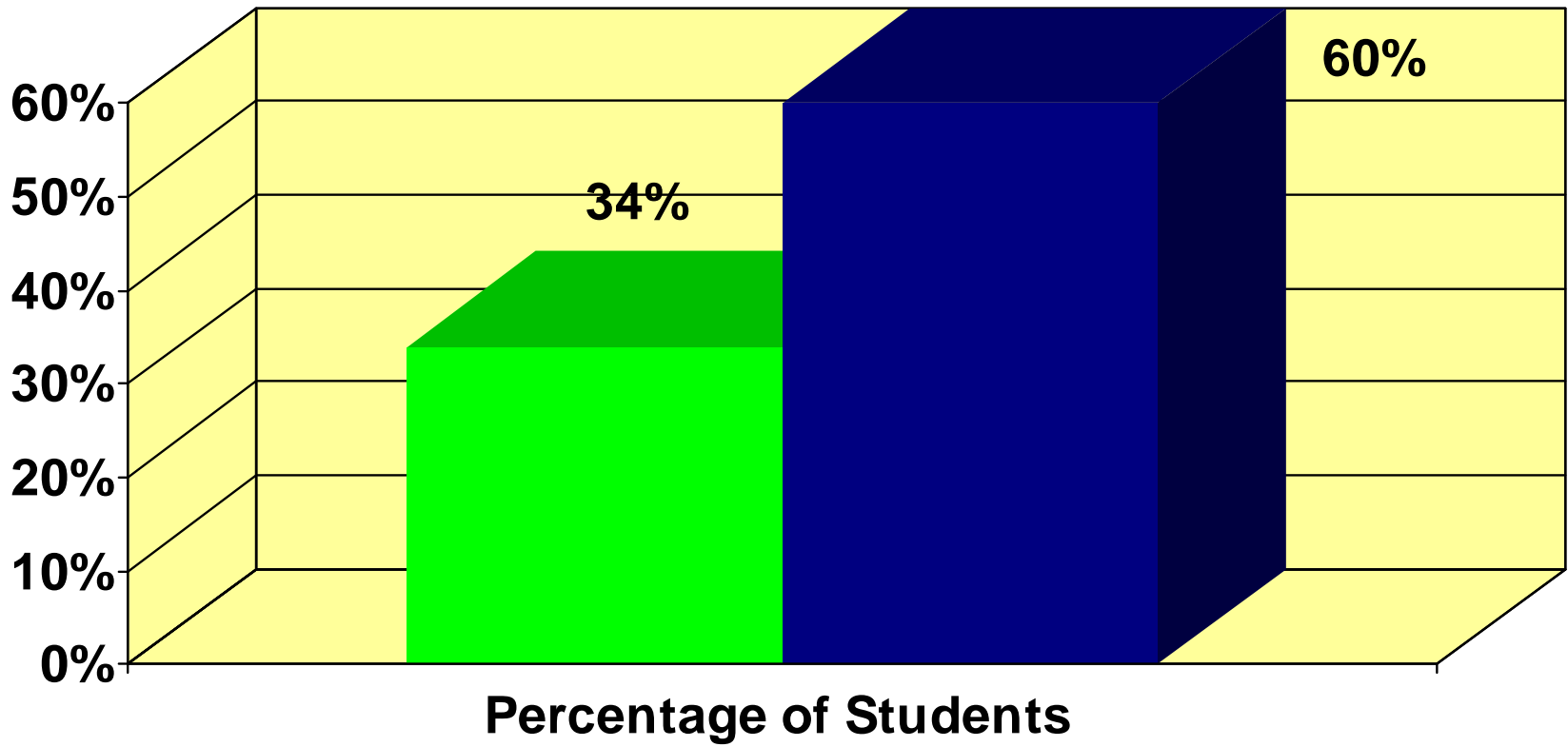
Select best articles:

- ❑ Blinded
- ❑ Rated by two expert clinicians
- ❑ Five best articles identified by experts
- ❑ Students selections measured against best articles identified by experts

Student-Expert Article Matches

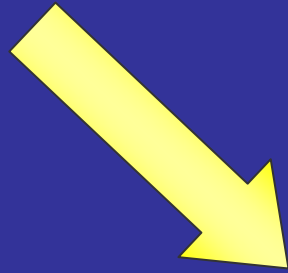
% of students selecting best articles

$P < 0.01$

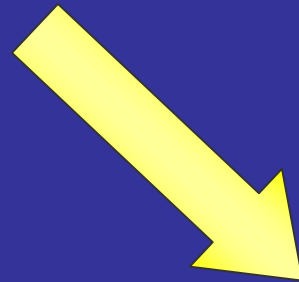


■ Control n = 104 ■ Intervention n = 112

Quality search strategy



Quality retrieval



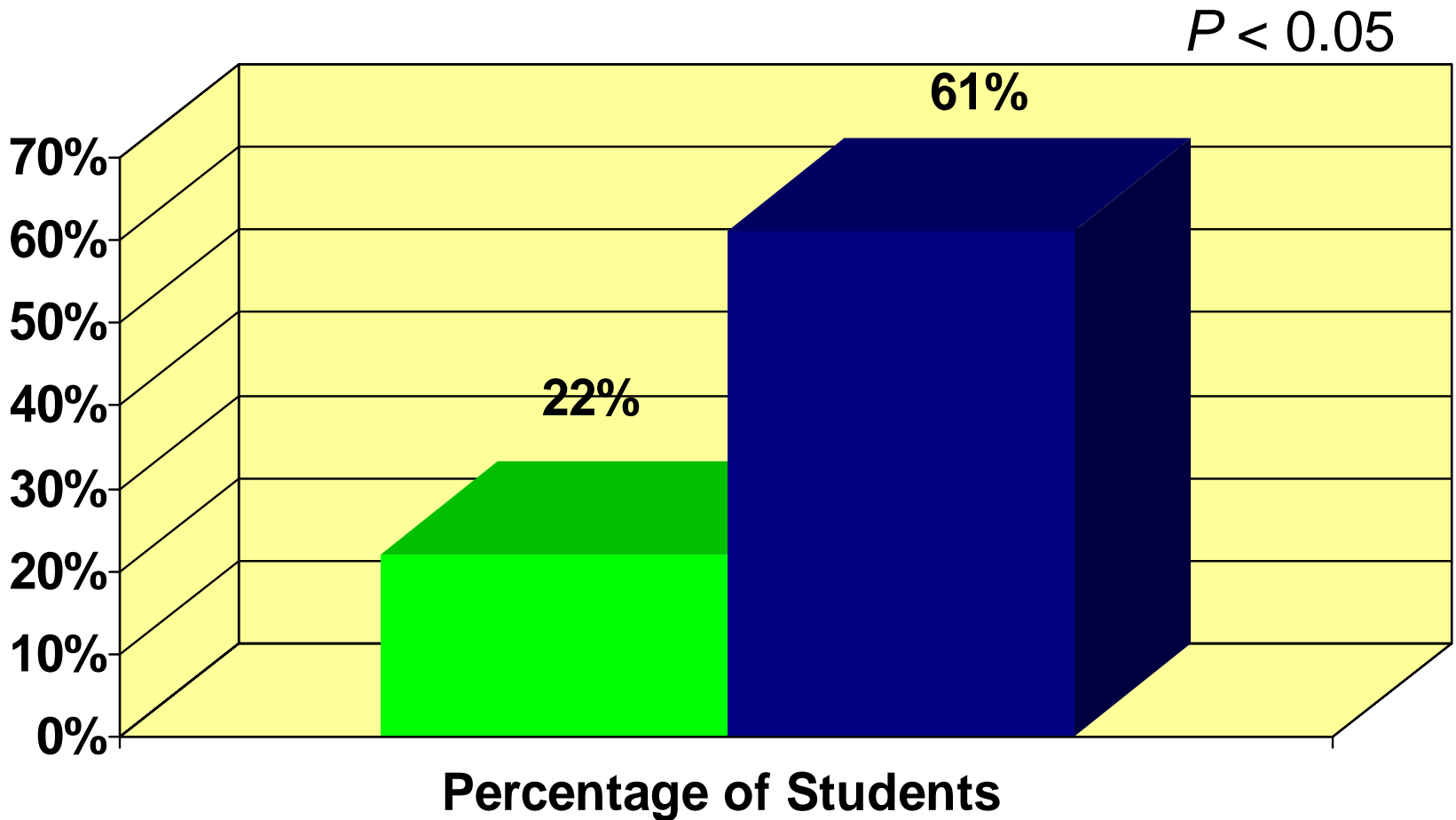
Select best articles

Searching Skills Self-Assessments

Self-ratings on a 1 (Novice) - 5 (Expert) scale

Skill Area	Post- Clerkship Mean		Intervention effective?
	<u>Control</u>	<u>Intervention</u>	
Writing clinical questions	3.6	3.8	} Yes <i>P</i> < 0.05
Cochrane databases	2.3	3.3	
Overall MEDLINE	3.9	4.3	
Overall EBM	3.2	4.6	

Percent of Students Correctly Calculating NNT



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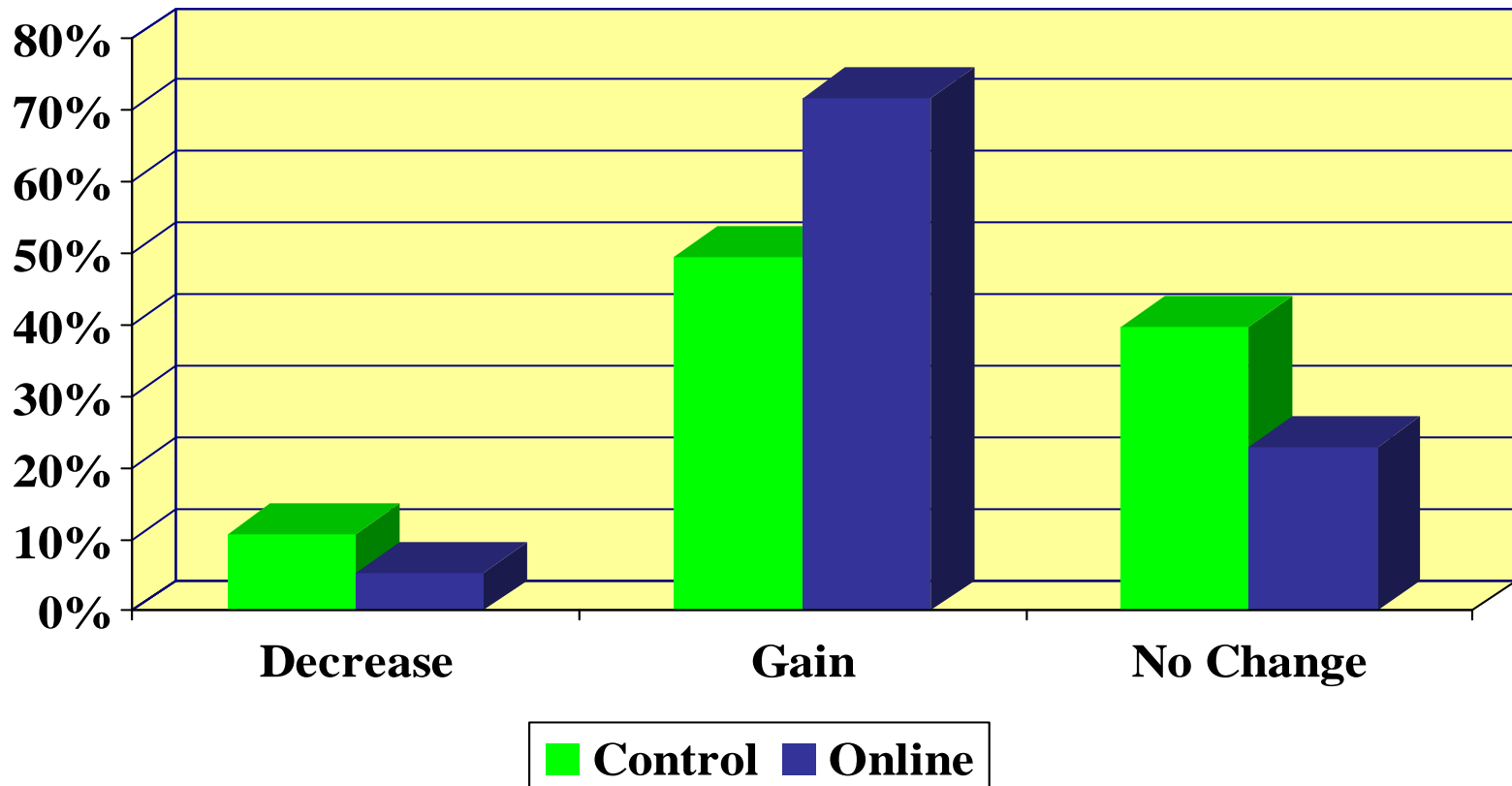


Medical Humanism and Students' Perceptions

Medical Humanism: Ability to Integrate Patients' Cultural Beliefs on Health & Illness into Patient Care

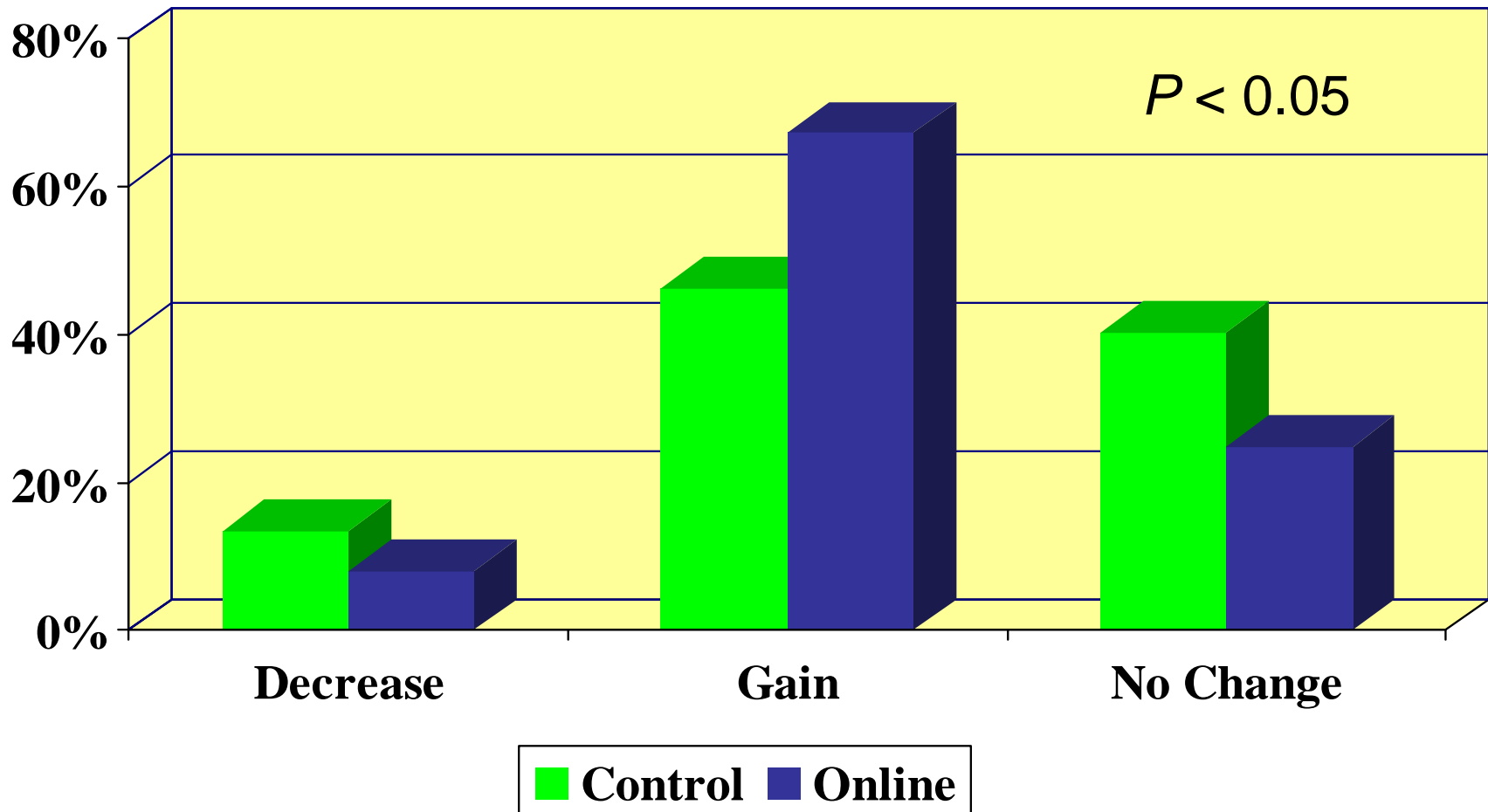
Self Reported Change of at least 1 Level Over 5 point Scale

$P < 0.03$



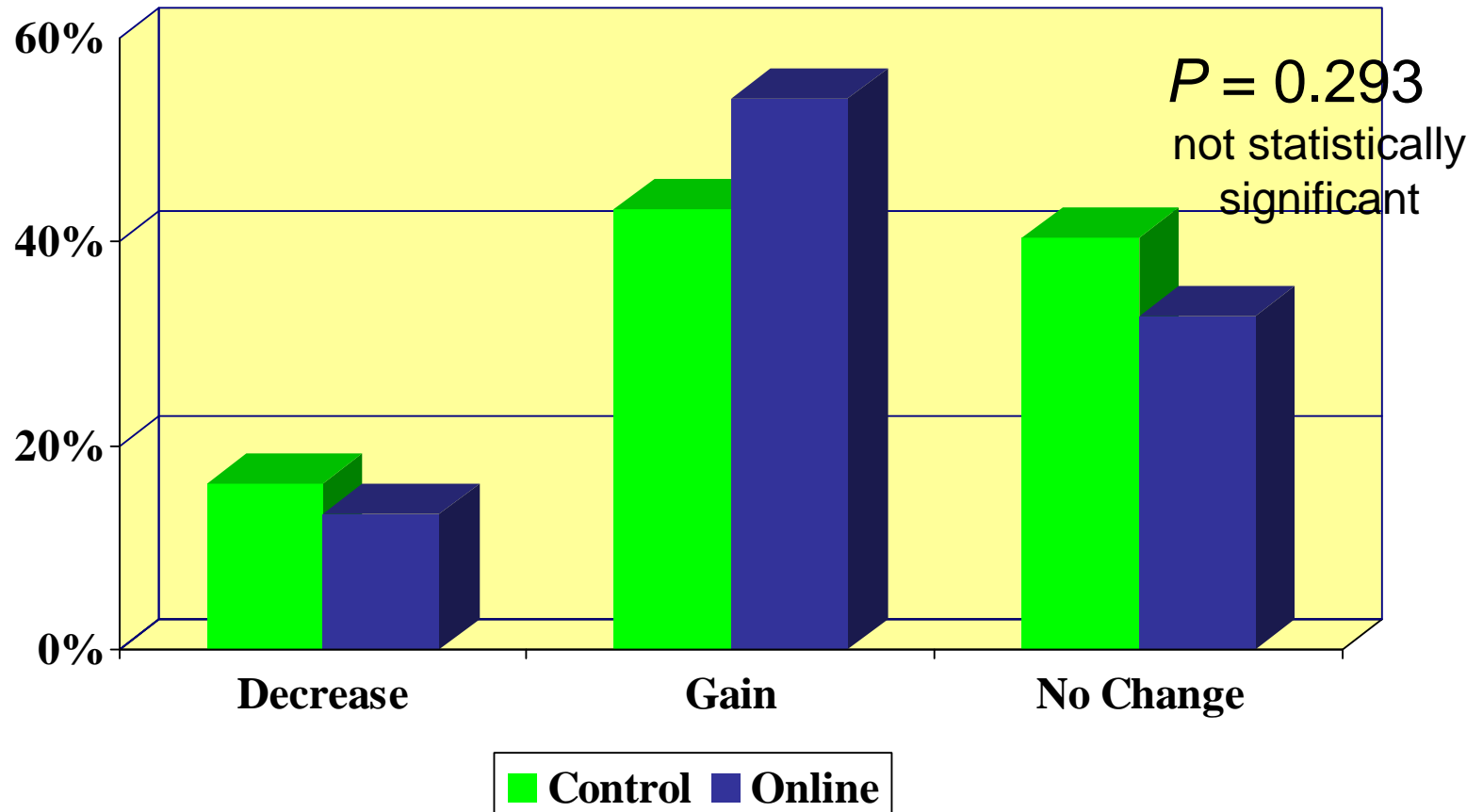
Medical Humanism: Ability to Elicit Patients' Emotional Impact from Illness

Self Reported Change of at least 1 Level Over 5 point Scale



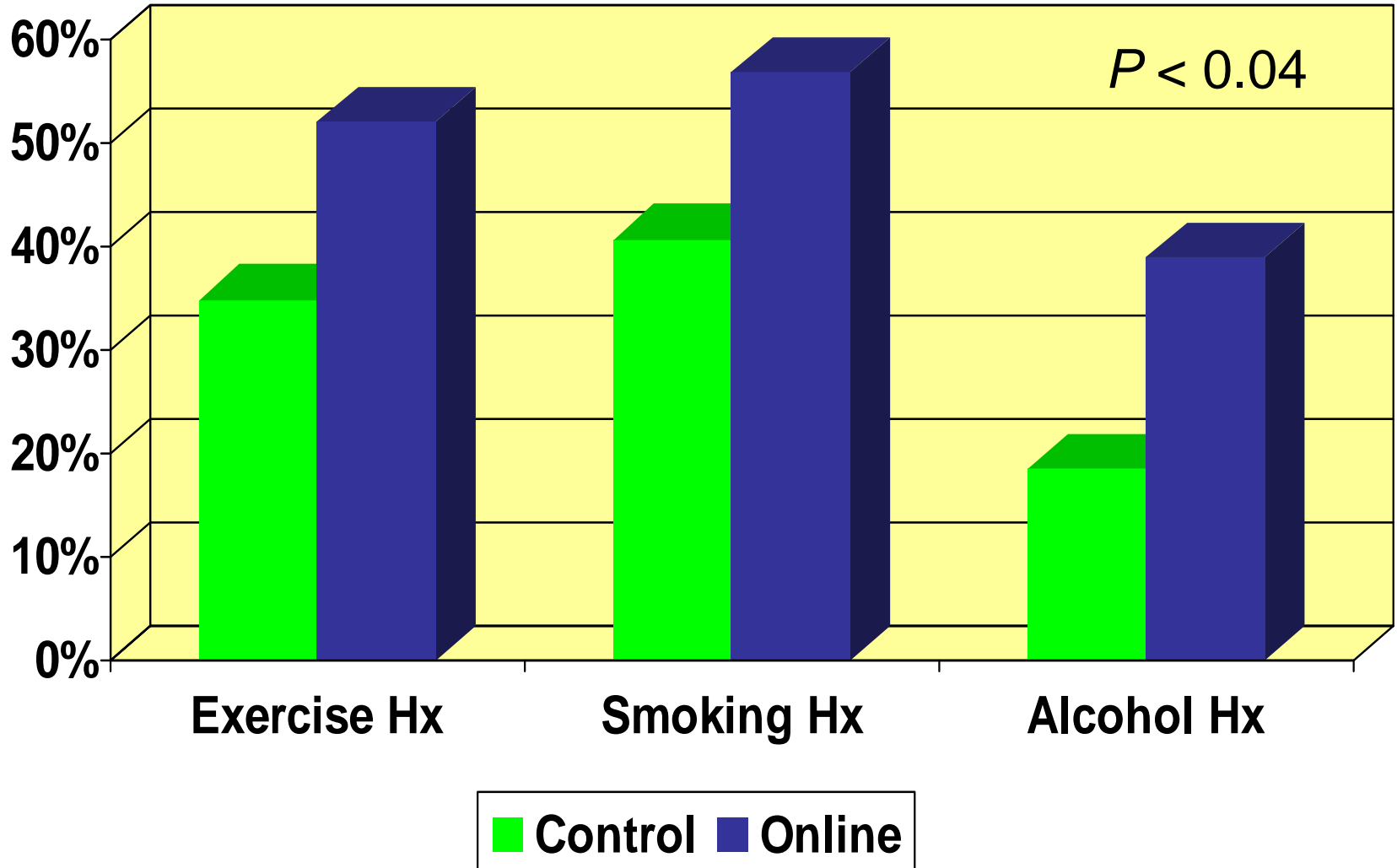
Medical Humanism: Awareness of Means by which Personal Values Influence Care of Patients

Self Reported Change of at least 1 Level Over 5 point Scale



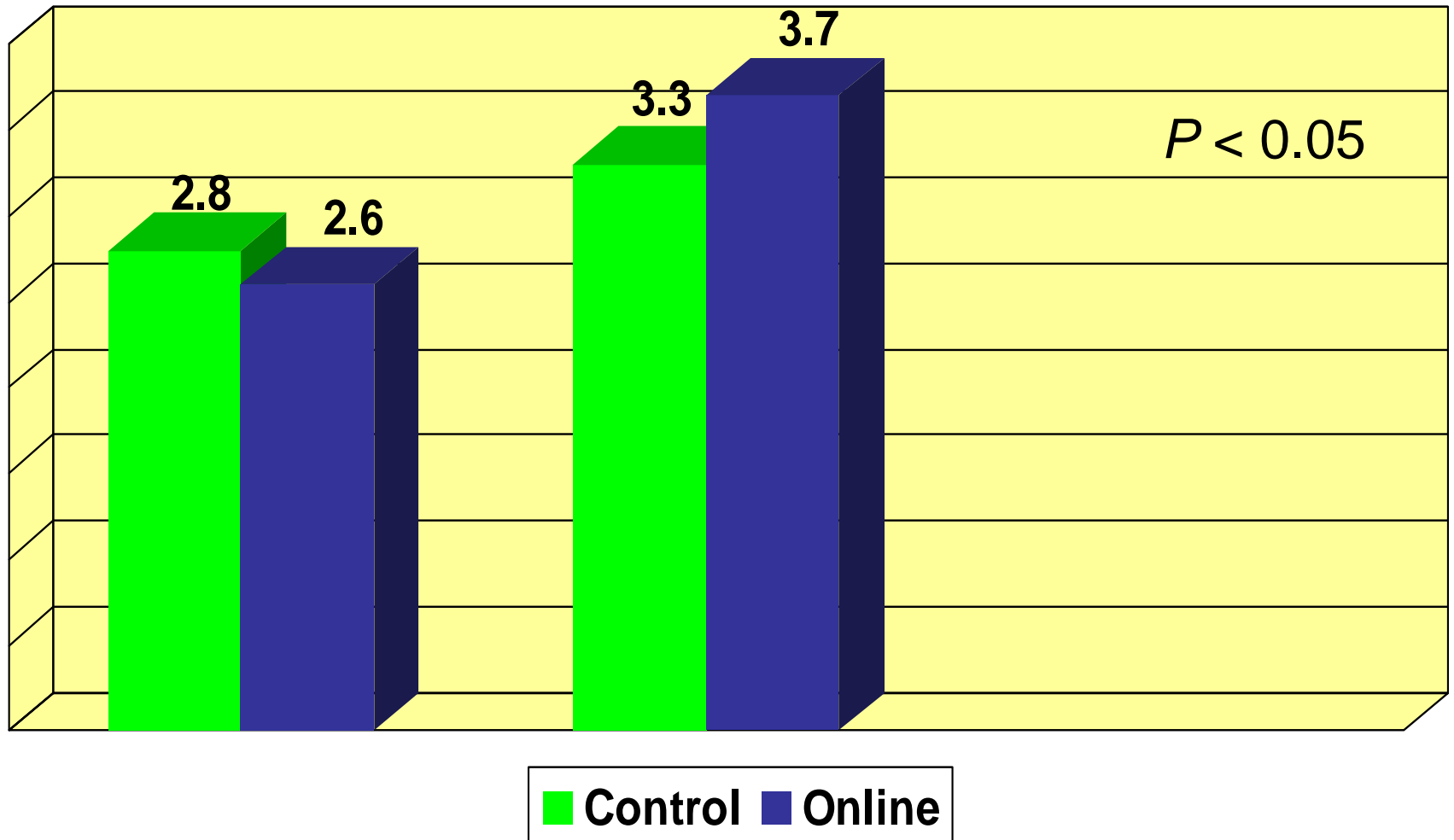
Patient Assessment Skills

Percent of students who inquired about these issues, post-clerkship



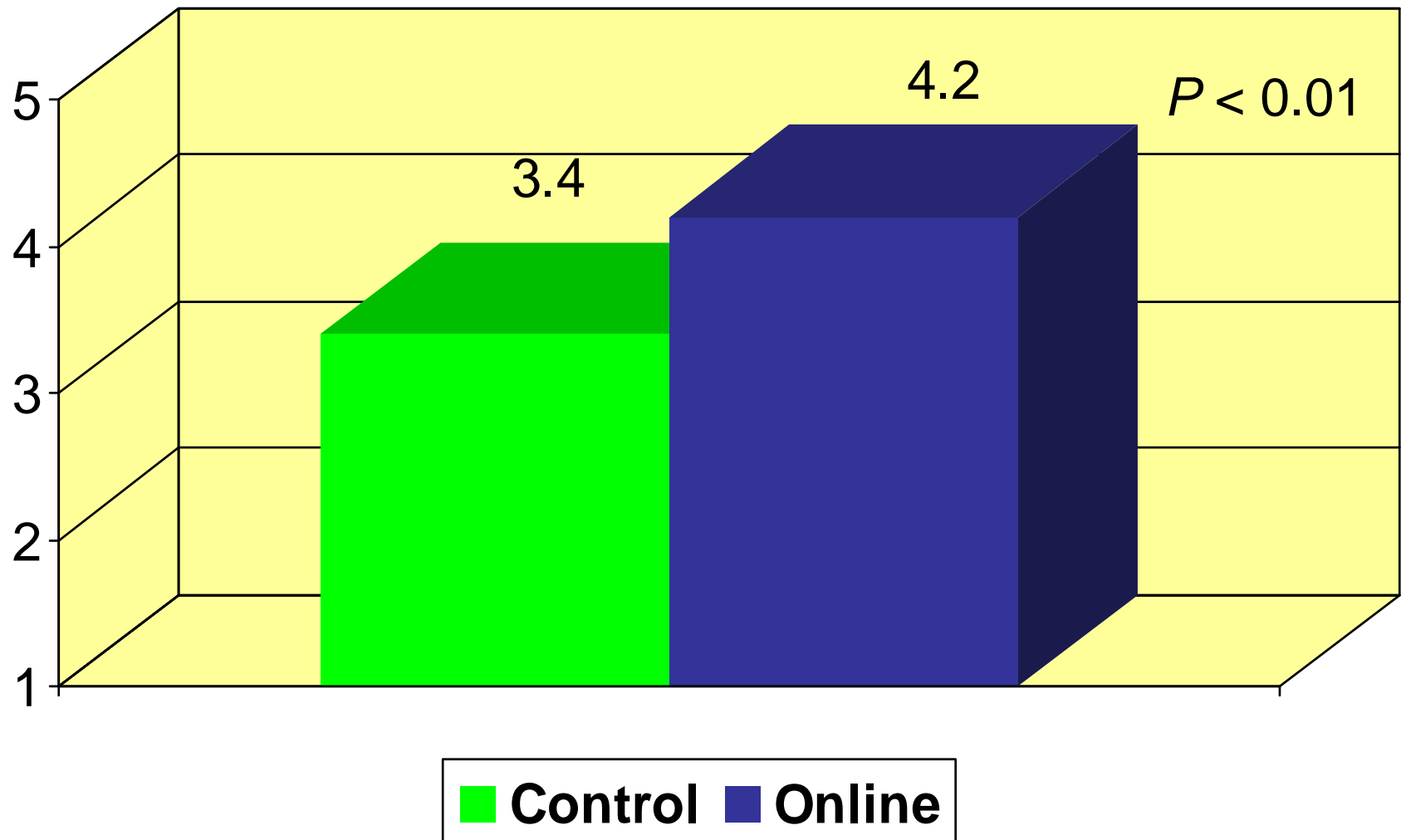
“I Know How to Locate Useful Clinical Guidelines and Protocols.”

Self Reported Change of at least 1 Level Over 5 point Scale



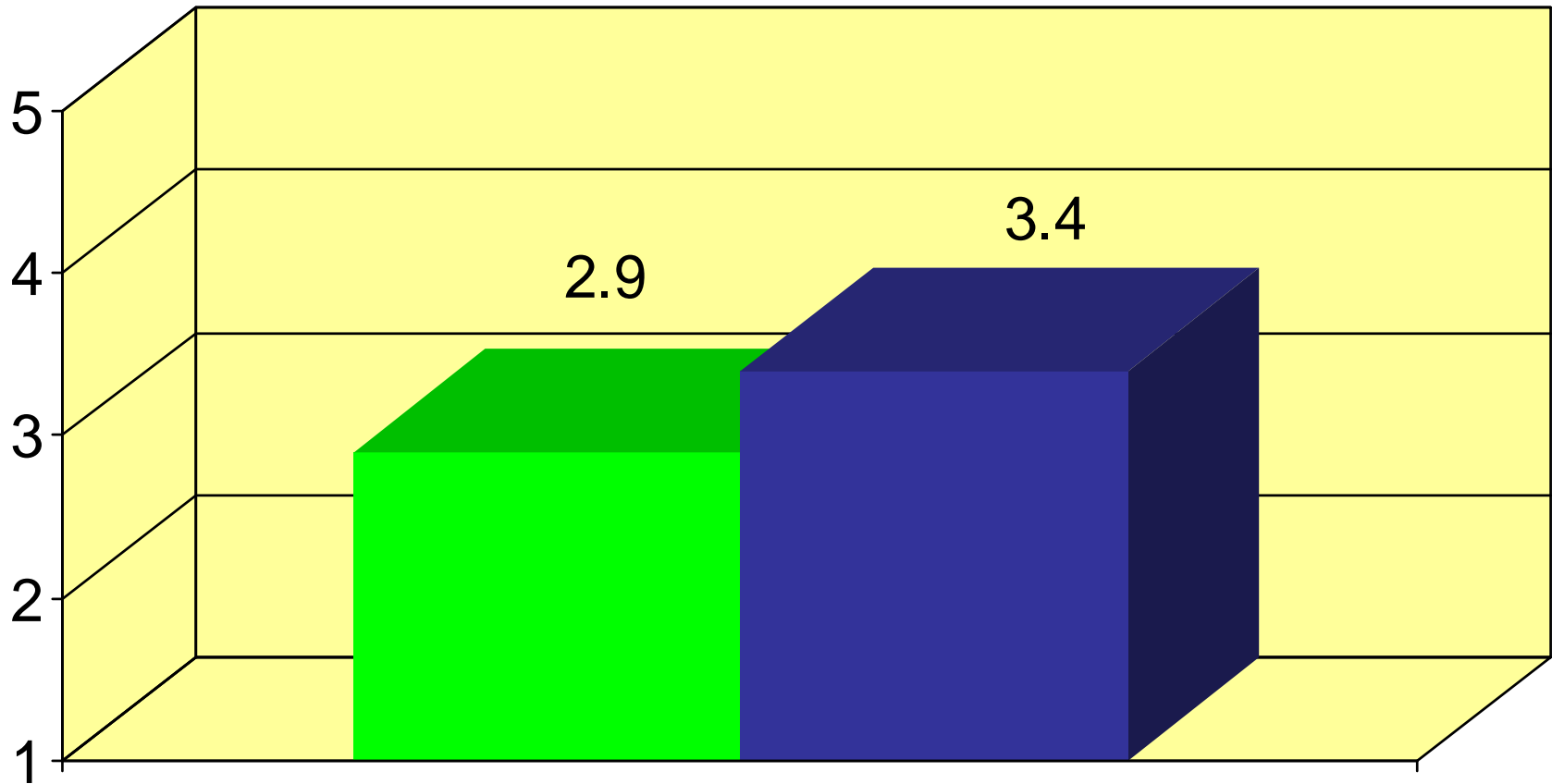
“The Clerkship improved my abilities to practice EBM.”

Average Rating where 1=Disagree Strongly - 5=Agree Strongly



“I learned from other clerkship students.”

Average Rating where
1=Disagree Strongly 5=Agree Strongly $P < 0.01$



■ Control ■ Online

Online Clerkship Assessment

Level of Agreement on a 1 (Do Not Agree) - 5 (Strongly Agree) scale

Question	<u># Agree</u>	<u># Do NOT Agree</u>
The online content was easy to use.	77	23
I valued interaction with other students.	73	24
I valued interaction with faculty.	76	21
My clinical preceptor provided time....	76	20
I enjoyed the online curriculum.	51	49

Research Results Overview

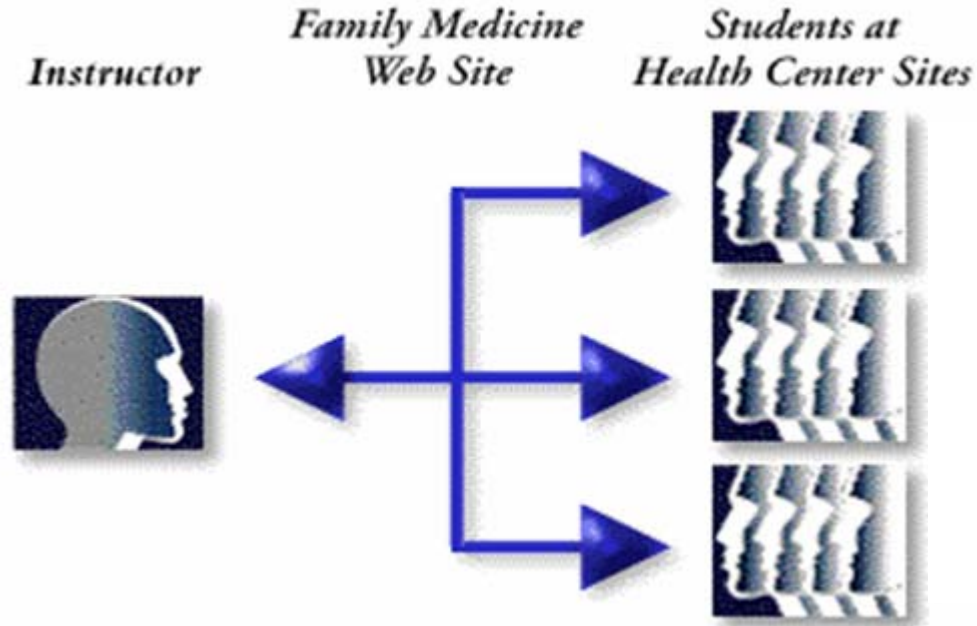
Online clerkship curriculum is viable method for:

- ❑ Promoting use of best available evidence
- ❑ Improving information retrieval skills
- ❑ Guiding patient management

Medical Education in the 21st Century

- ❑ Remote learning technologies
- ❑ Remote communication
- ❑ Problem-solving
- ❑ Lifelong learning
- ❑ Information literacy
- ❑ Evidence-Based Medicine

Online Family Medicine Clerkship Distance Learning for Health ©



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