Controlled Evaluation of a Computer Based Atlas of Histopathology

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Problem:
Is computer-based instruction in pathology better or equivalent to the use of textbooks or printed atlases?

Common Approaches of CBT Evaluation:

Peer Review Based on Criteria Catalogues

cf. http://www.imbi.uni-freiburg.de/medinf/kat_e.htm

User Interviews / Questionnaires

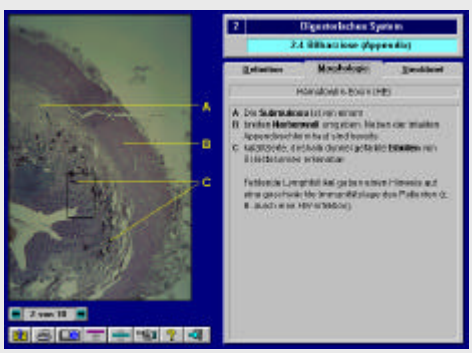
Questionnaire

		1	2	3	4	5
1	What's your computer experience.	x				
2	Usability			x		
3	Time performance			x		
4	User interface				x	
5	Selection of pictures				x	
6	Completeness of the pictures			x		
7	Quality of the pictures				x	
8	Completeness of the text			x		
9	Quality of texts					x
10	I like the program...			x		
11	I like learning with the computer ...				x	
12	A user's manual would be useful.		x			
	(...)					

These methods are important, but suffer from limited reliability and validity since the outcome of the didactic process is not directly measured.

Complementary Approach:

Outcome oriented evaluation of a CBT program using the methods of a randomized controlled trial.



The CBT program evaluated by this method *MicroPat*, is an atlas of histopathology, developed by the authors and designed especially to support medical students during the course of pathology in the 3rd year. MicroPat is a hypermedia application with more than 1300 images and describing texts.

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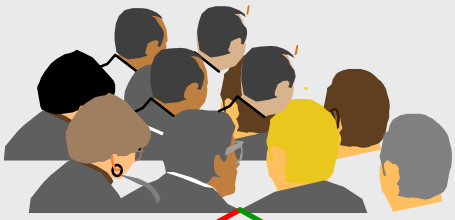
Method: Cross-Over Study

3rd Year Medical Students



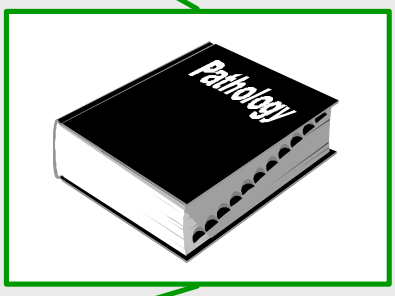
N=72

Randomized Assignment

N=36 **N=36**

Subject **A**

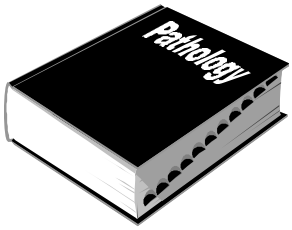
(Prostatic & Mamma Diseases)



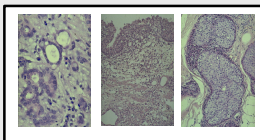
t = 50 min

Subject **B**

(Prostatic & Mamma Diseases)



t = 50 min

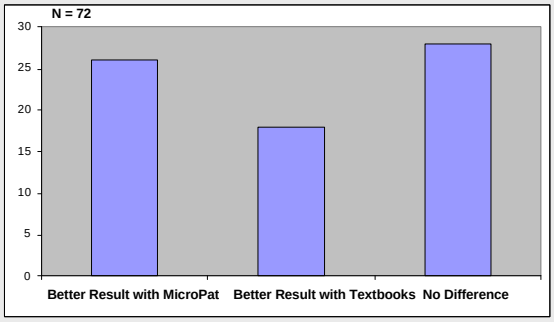


Performance Assessment (recognition of 3 unknown microscopical slides from A, 3 from B)

Questionnaire: self-rating of diagnostic certainty
(1 = “uncertain”, 2 = “quite certain”, 3 = “absolutely certain”)
Questions for assessment of “computer literacy”

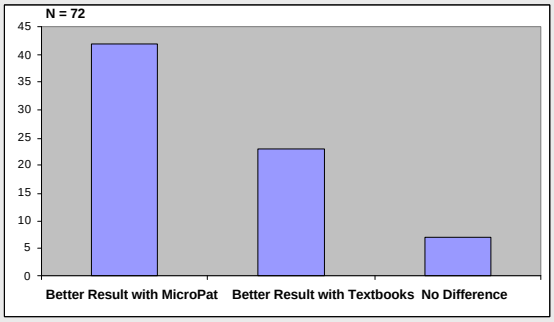
AMIA '98
ANNUAL SYMPOSIUM

Results



Outcome of Correct Diagnoses of Unknown Microscopical Slides.

Not Significant for $\alpha = 0.05$



Outcome of Correct Diagnoses of Unknown Microscopical Slides, Weighted by Certainty Score.

Significant for $\alpha = 0.05$

Other Findings:

- Students that rated themselves familiar with computers showed better results in both, book and computer learning.
- lack of “computer literacy” had no influence on the relative outcome of computer learning vs. book learning.

Conclusion:

The outcome of the use of MicroPat was at least equivalent to the use of text books for preparing the pathology exam. MicroPat proved to be user-friendly enough not to affect the outcome of students with less computer experience. We consider the cross-over design suitable for comparing different didactic methodologies and suggest its use especially for the assessment of computer-based methods.