2017

A Prospective Trial: Traditional Versus Video-based Teaching For Gynecologic Surgery

Mireille Truong
VCU

A prospective trial: traditional versus video-based teaching for gynecologic surgery

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COLUMBIA UNIVERSITY MEDICAL CENTER
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Disclosures

None

Background: Videos for medical education

- Effective for teaching clinical & basic surgical skills in other specialties
- Increased comfort with procedures
- Comparable to expert instruction in improving clinical performance
- Improved knowledge but not psychomotor skills performance

Background:
More data needed

- Effectiveness of videos for gynecologic training
- Optimal video of content and format
  - Trainees learning style
  - Fund of knowledge
  - Surgical skills

Primary Objective

- Compare traditional versus video-based education for gynecologic surgery training on:
  - cognitive performance
  - surgical skills performance

Secondary Objective

- Evaluate the impact of individual learning preferences on performance

Methods

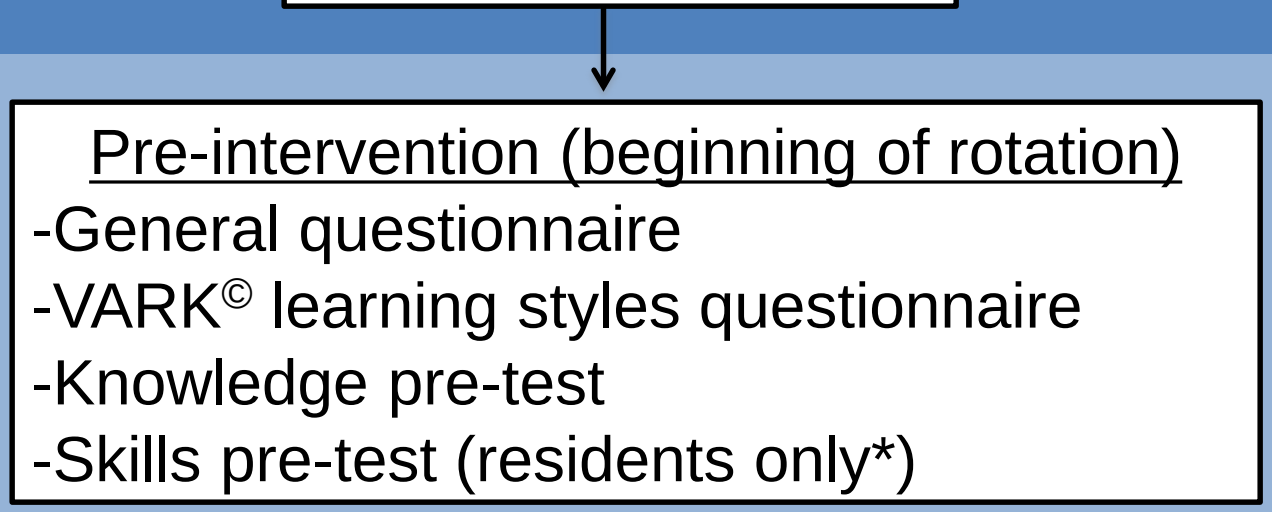
- IRB approved
- Prospective study
- Large, urban, university-hospital medical center
- 1 year (January-December 2015)

Medical students
OBGYN Residents

Medical students
OBGYN Residents

- During gynecologic surgery rotation (4weeks)
- Group assignment:
  - Residents:
    - Non-algorithmic randomization
    - By year of training
  - Medical students:
    - Alternating rotation blocks
- Verbal consent was obtained and documented

Medical students
OBGYN Residents



Medical students
OBGYN Residents

Pre-intervention (beginning of rotation)

-General questionnaire

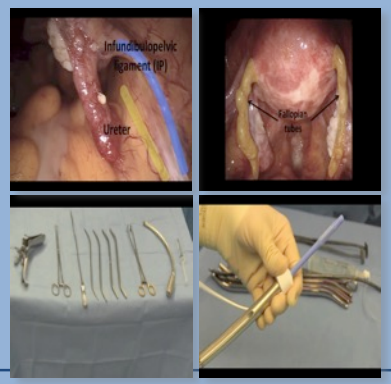
-VARK© learning styles questionnaire

-Knowledge pre-test

-Skills pre-test (residents only*)

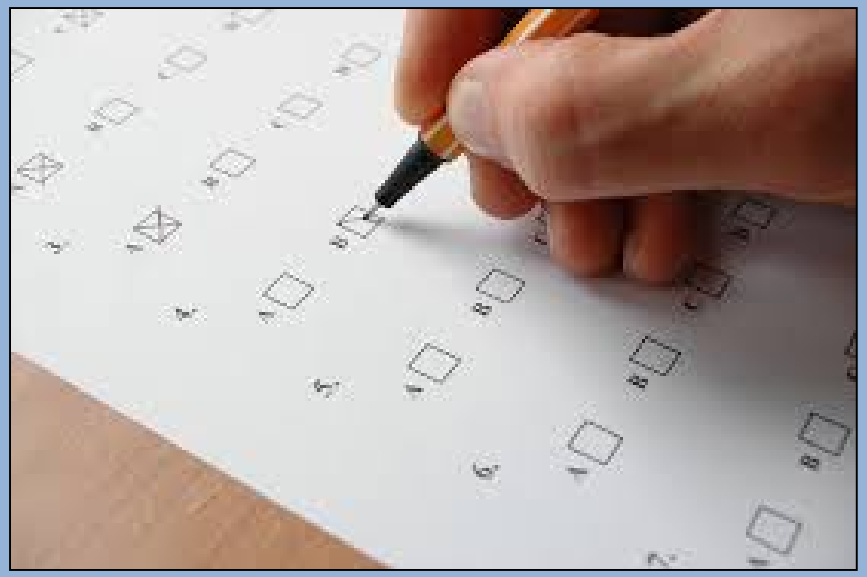
Traditional Group (TT)

Video-Based Group (VBT)



Methods

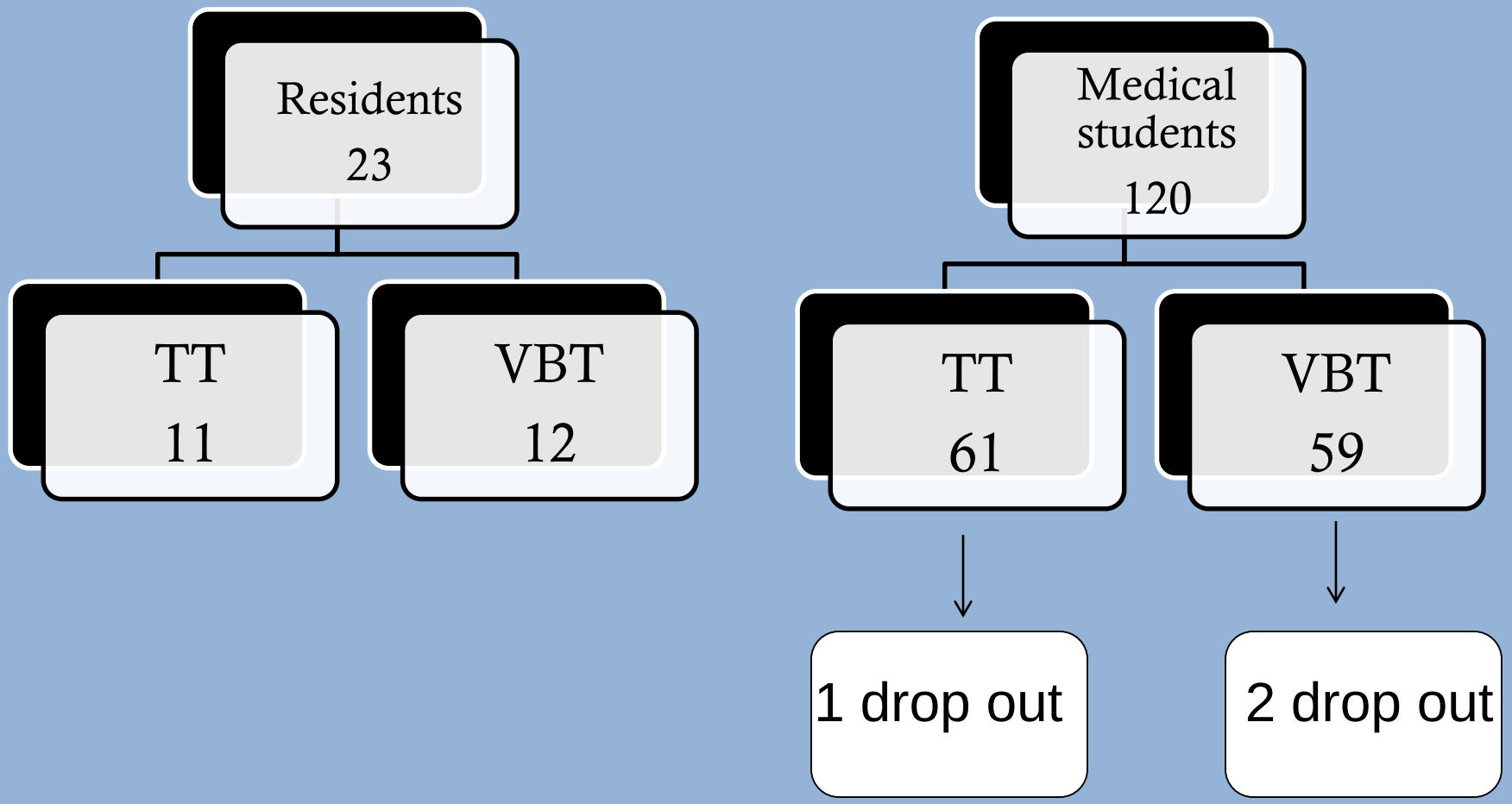
Post intervention (end of 4wk-rotation)
-Knowledge post-test
-Skills post-test
-Exit questionnaire



Methods

- Analysis:
  - Residents & Medical Students analyzed separately
  - Compared change in performance scores between VBT and TT (paired t-test)
  - Evaluated effect of learning preference on performance scores (linear regression)
- $p < 0.05$ considered statistically significant

Results


Residents
23
TT
11
VBT
12
Medical students
120
TT
61
VBT
59
1 drop out
2 drop out

Results

Mean change in performance

	Medical Students				Residents			
	TT (n = 60)	VBT (n = 57)	p-Value*	95% CI	TT (n = 11)	VBT (n = 12)	p-Value*	95% CI
Knowledge test score mean change (SD)	7.03 (4.02)	**8.65** (3.48)	**0.02**	-3.0 – (-0.24)	4.09 (7.23)	4.17 (6.13)	0.98	-5.87 – 5.72
Skills test score* (SD)	4.28 (1.71)	**6.22** (2.06)	**<0.001**	-2.63 – (-1.24)	0.36 (2.06)	**2.45** (2.40)	**0.04**	-4.05 – (-0.14)
Skills test time in seconds (SD)**	208.18 (74.49)	197 (69.84)	0.40	-15.29 – 37.66	5.27 (72.66)	-42.83 (43.00)	0.06	-3.12 – 99.33

*Skills test /12 points with max time of 500 seconds;

**absolute score and time for medical students, mean change in score and time for residents

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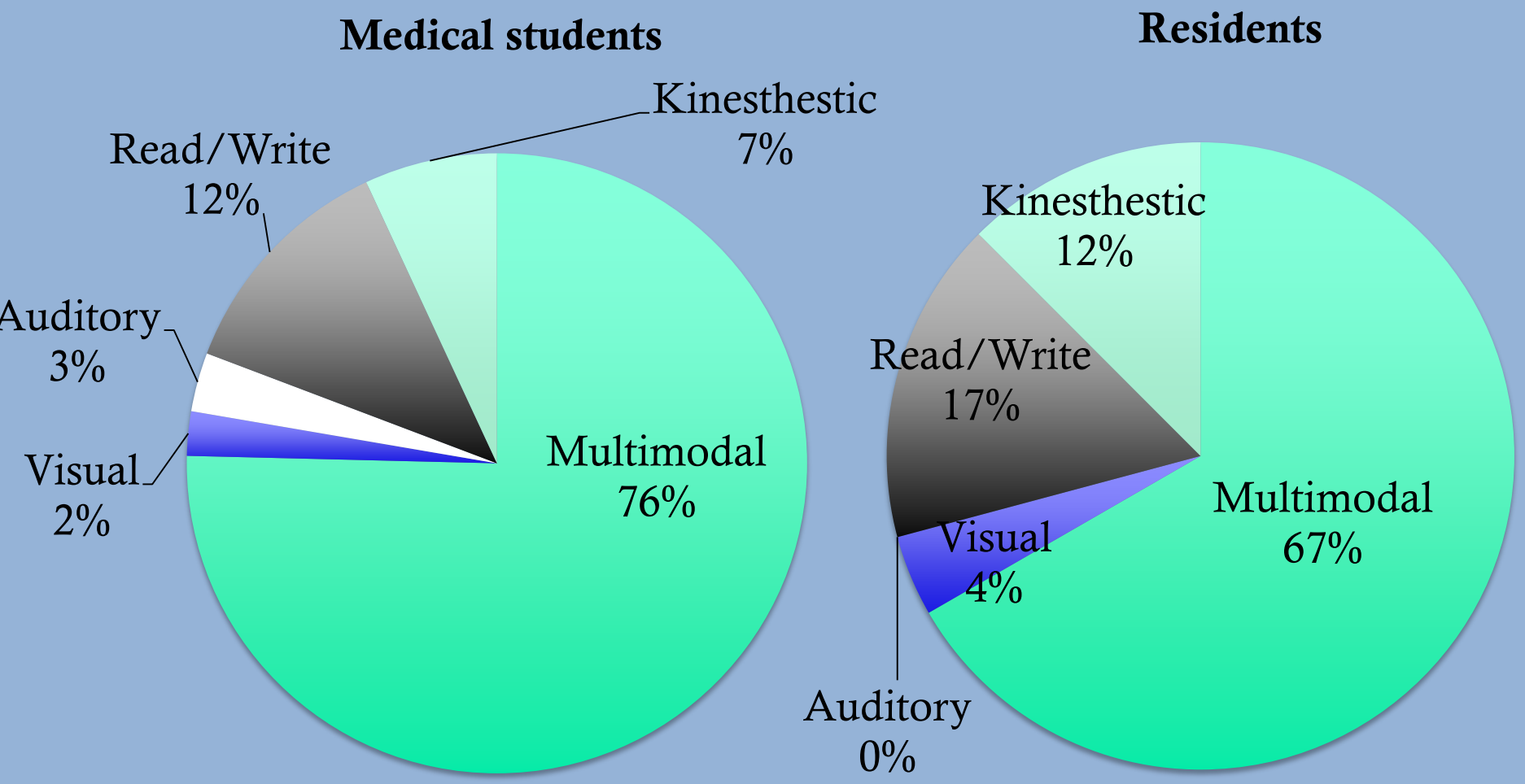
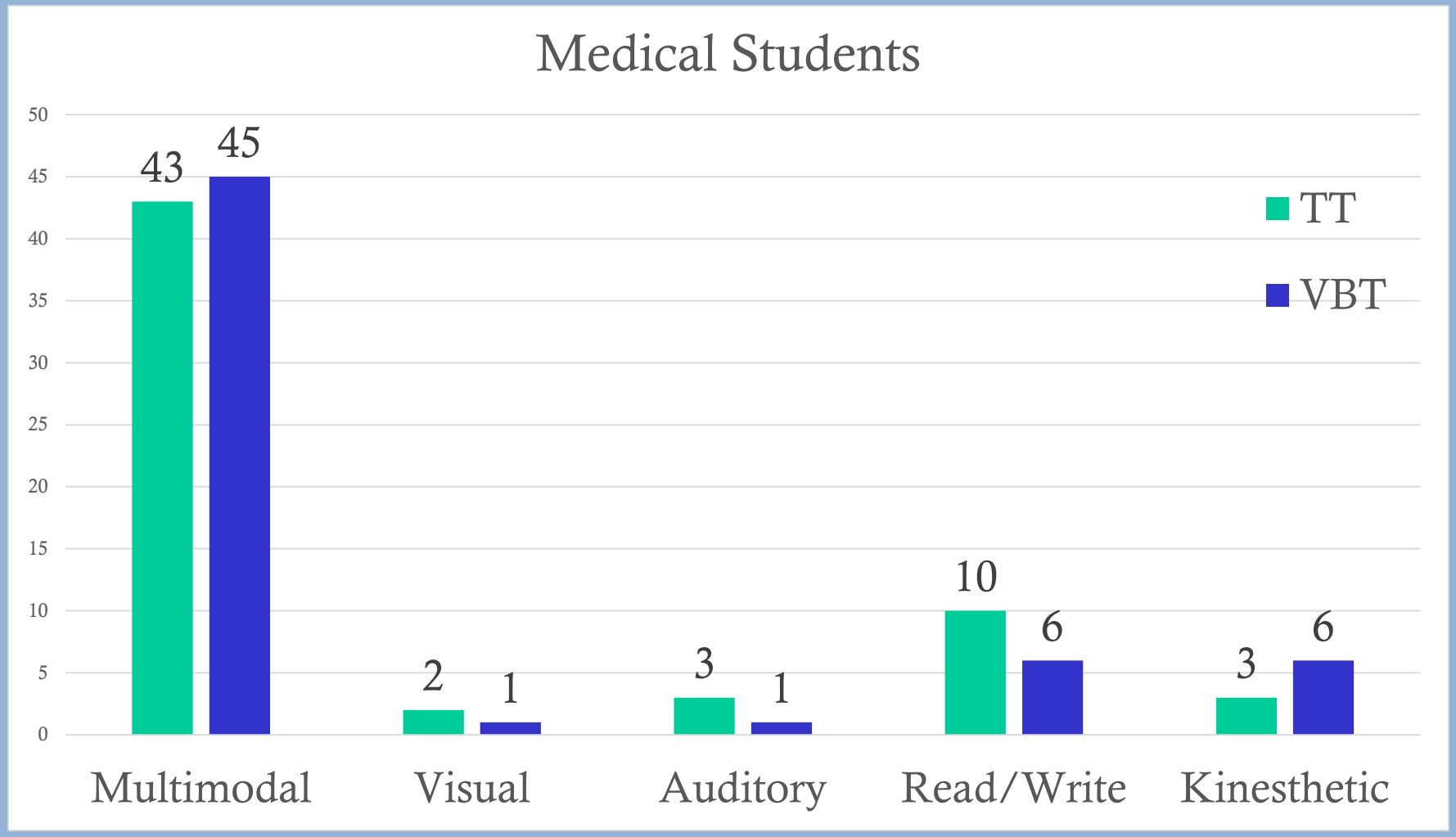
Learning Preferences



Learning Preferences: VBT vs TT



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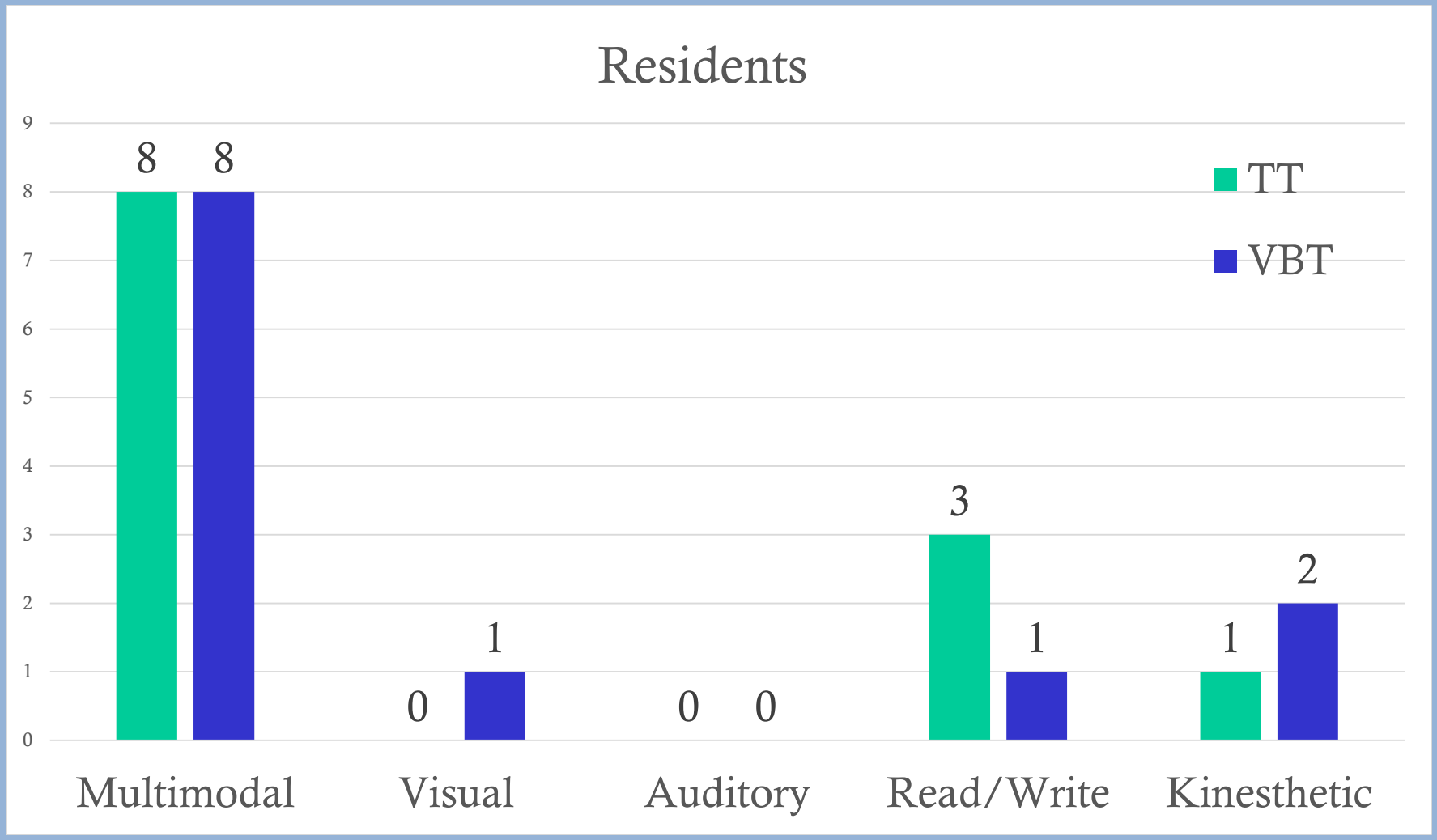

Medical Students
Learning Styles vs Performance

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Auditory	0.29 (0.14)	-0.00 (0.07)	**0.04**	0.98	**0.01 – 0.56**	-0.14 – 0.14
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Residents
Learning Styles vs Performance

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	Knowledge Test	Skills Test	Knowledge Test	Skills Test	Knowledge Test	Skills Test
Visual	-0.02 (0.44)	-0.04 (0.14)	0.96	0.77	-0.95 – 0.91	-0.33 – 0.25
Auditory	-1.78 (0.96)	0.71 (0.03)	0.08	**0.03**	-3.80 – 0.24	**0.08 – 1.34**
Read/write	0.45 (0.44)	-0.04 (0.24)	0.32	0.79	-0.47 – 1.38	-0.33 – 0.25
Kinesthetic	0.07 (0.72)	-0.04 (0.22)	0.93	0.85	-1.46 – 1.59	-0.52 – 0.43

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Summary of results: Video vs traditional

- **Surgical skills performance**
  - Video > traditional
  - Improvement:
    Med Students > Residents
- **Cognitive performance**
  - Video > traditional (med students)
  - Video = traditional (residents)
- **Time to complete surgical task**
  - Video < traditional (NOT significant)

Summary of results: Learning preference

- Medical students & residents: **multimodal**

<u>Medical Students:</u>

- ↑Auditory → ↑cognitive performance
- ↑ Visual →↑cognitive performance

<u>Residents</u>

- ↑Auditory →↑surgical skills performance

Conclusions

- Educational videos:
  - Additional effective learning tool for gynecologic surgery education
  - Psychomotor and cognitive skills acquisition
  - Tailored to level of training, type of skill to be learned and learning preference
- Learning preference can affect psychomotor and cognitive skills acquisition
- Visual and/or auditory learning preference may enhance performance in gynecologic surgery

Limitations

- Limited generalizability
  - Single institution
  - Convenience sampling
- Testing effect
- Variability of exposure during clinical rotation
- Maturation of participants
- Non-blinded subjects
- Not true randomization
- Lack of large sample size

Strengths

- One of few prospective studies evaluating video-based education for gynecologic surgery training
- Use of validated questionnaire for learning preference
- Standardized instrumentation throughout study
- Established construct validity of skills and knowledge test
- Blinded clinical instructors
- Same pre and post test examiner

Future Considerations

- Determine how to effectively match video content to level of training, type of training, learning preference
- Effect of repetition and interval of video training
- Evaluate retention
- How to implement effectively into a curriculum
- Randomized multi-specialty & multi-centered studies

Acknowledgements

Co-authors:

- Rini Ratan, MD
- Claire Tobias, MD
- Jimmy Duong

References

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