



# Evidence-Based Testing Practices in Nursing Education: Does Faculty Experience Count?

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# Introduction

- ▶ The focus of this research was evidence-based testing practices in nursing education
- ▶ Five groups of faculty were compared to determine if experience played a role in the implementation of evidence-based testing practices
- ▶ Benner's from novice to expert theory was used to guide the research study

# Background

- ▶ Nursing exams are the most important factor in determining student progression.
- ▶ Evidence-based testing practices are not consistently implemented in nursing education
- ▶ Very little research regarding testing in nursing education
- ▶ No research that identifies the characteristics of educators who most frequently implement evidence-based testing practices
- ▶ Understanding such differences will serve as a foundation for further discussion and research around this topic and may ultimately enhance evidence-based testing in nursing education

# Literature Review

- ▶ Written examinations are the most important measure to evaluate learning and determine student progression (Oermann, Saewert, Charasika, & Yarbrough, 2009)
- ▶ Faculty value evidence-based teaching and testing practice but are not consistently implementing such practices (Kalb et al, 2015; Killingsworth et al., 2015; Oermann et al., 2009)
- ▶ Many nurse educators report feeling unprepared to effectively develop and use written examinations (Halstead, 2013; Killingsworth et al., 2015)
- ▶ Up to 90% of faculty-developed exams contain flaws, and a number of nurse educators report that they do not conduct test item analysis (Oermann et al., 2009; Tarrant & Ware, 2008)
- ▶ Student learning and educational outcomes are enhanced when they are consistently exposed to high-quality test items (Schroeder et al., 2013; Su et al., 2009; Tarrant & Ware, 2008)

# Literature Review- Experience levels

- ▶ Novice nurse educators are often clinical experts with no formal preparation for the teaching role, and often receive little mentoring (Cangelosi, 2014; Cooley & De Gange, 2016; Weidman, 2013).
- ▶ Faculty with more teaching experience are confident in their teaching and testing abilities but may not be using the most effective, evidence-based testing strategies (Oermann et al., 2009; Schaefer & Zygmunt, 2003).

# From Novice to Expert

- ▶ Skill acquisition theory
- ▶ Describes how knowledge changes over time based on experience
- ▶ 5 experience levels
  - ▶ Novice: < 1 year of teaching experience
  - ▶ Advanced beginner: 1-2 years of teaching experience
  - ▶ Competent: 3 years of teaching experience
  - ▶ Proficient: 4-5 years of teaching experience
  - ▶ Expert: > 5 years of teaching experience

# Sample

- ▶ Inclusion criteria
  - ▶ Full-time Nursing Faculty of all levels of experience
  - ▶ Employed at Baccalaureate Nursing Programs
  - ▶ Develop and analyze their own written exams

# Sample

- ▶ 177 nurse educators
- ▶ 37 states represented
- ▶ Representative of nurse educator population (NLN, 2017)
  - ▶ 96% female
  - ▶ 96.6% white
  - ▶ Majority over the age of 55 years
  - ▶ Majority held a MSN as highest earned degree

# Methodology--Sample

Gender	Percentage	Sample
Female	96%	168
Male	4%	7
Race/Ethnicity		
White	96.61%	171
Black	1.96%	3
Asian	1.13%	2
Hispanic/Latino	1.13%	2
Age		
25-35	8.57%	15
36-45	17.71%	31
46-55	34.39%	60
56 an older	39.43%	69

Highest Earned Degree	Percentage	Sample
MSN	42.37%	75
MS other	1.13%	2
PhD Nursing	22.03%	39
PhD other	6.78%	12
DNP	18.08%	32
EdD	9.04%	16
BSN	.56%	1
<b>Course Development</b>		
Yes	79.01%	140
No	18.08%	32
<b>Number of Courses</b>		
More than one	43.5%	77
One	18%	32
No courses taken	38.41%	68
<b>CNE</b>		
Yes	22%	39
No	77.97%	138
<b>Teaching Experience</b>		
Less than 1 year	5.08%	9
1-2 years	7.91%	14
3 years	7.34%	13
4-5 years	9.6%	17
Greater than 5 years	70%	124

# Data Collection

- ▶ Letters to Deans and Chairs of Baccalaureate Nursing Programs
- ▶ Recruitment letter with link to electronic survey forwarded by Deans and Chairs to full-time faculty
- ▶ All participants completed the Best Practices in Test Development and Analysis survey
- ▶ Eligible participants were placed into groups depending on their years of teaching experience

# Instrument

- ▶ Best Practices in test development and analysis survey created by Dr. Killingsworth
- ▶ Demographic information
- ▶ 12 test development questions
- ▶ 6 test analysis questions
- ▶ 10 test revision questions
- ▶ Participants rated how often they use the outlined best practices on a 7-point Likert scale

# Data Analysis

- ▶ Participants grouped by level of teaching experience in years
- ▶ Individual and group means calculated
- ▶ Leven's test to measure homogeneity of variances
- ▶ One-way ANOVA used to determine significant differences between groups at the  $p < .05$  level
- ▶ Brown-Forsyth and Welch tests to determine significance when heterogeneity of variances identified
- ▶ Post Hoc analysis conducted using the Tukey Method when significant differences identified

# Results—Group Means

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
<1	6	151.00	26.367	10.764	123.33	178.67	122	183
1-2	13	137.46	44.130	12.239	110.79	164.13	47	184
3	13	146.85	17.180	4.765	136.46	157.23	127	178
4-5	15	141.13	22.319	5.763	128.77	153.49	92	174
>5	120	160.89	20.850	1.903	157.12	164.66	75	189
Total	167	155.84	24.664	1.909	152.08	159.61	47	189

# Results

- ▶ Research Question: Is there a significant difference in the implementation of evidence-based testing practices for faculty teaching at Baccalaureate nursing programs when faculty are grouped and compared by five teaching experience levels?
- ▶ Findings
  - ▶ ANOVA  $p=.00$
  - ▶ Welch  $p=.011$
  - ▶ Brown-Forsythe  $p=.017$

# Results

- ▶ Tukey post-hoc analysis
  - ▶ Significant differences occurred between:
    - ▶ Expert (> 5 years of experience) and advanced beginner (1-2 years of experience)  $p=.007$
    - ▶ Expert and proficient (4-5 years of experience)  $p=.020$

# Conclusions

- ▶ All three statistical tests (ANOVA, Brown-Forsythe, Welch) showed significant differences between groups at the  $p < .05$  level
- ▶ Post-hoc analysis identified significant differences between two groups; the expert and the advanced beginner, and the expert and proficient groups
- ▶ Findings support Benner's theory in relation to nurse educators

# Discussion of Results

- ▶ Based on the literature review, significant differences were expected between groups
- ▶ Significant differences were expected between the novice (<1 year of experience) and the expert (>5 years of experience) groups. However, significant differences were not identified between these groups
- ▶ Educational preparation may be a significant factor
  - ▶ Nursing education degree
  - ▶ PhD
  - ▶ Course work in test development and analysis



<b>Group</b>	<b>Mean survey score</b>	<b>% with a nursing education degree</b>	<b>% with a PhD</b>
Novice <1 year	151.00	62.5%	22.22%
Advanced beginner 1-2 years	137.46	50%	0%
Competent 3 years	146.85	53.85%	23.08%
Proficient 4-5 years	141.13	52.54%	5.88%
Expert > 5 years	160.89	63.1%	26.62%



<b>Group</b>	<b>Mean survey score Rank</b>	<b>% with a nursing education degree</b>	<b>% with a PhD</b>
Novice <1 year	2	2	3
Advanced beginner 1-2 years	5	5	5
Competent 3 years	3	3	2
Proficient 4-5 years	4	4	4
Expert > 5 years	1	1	1

# Implications for Nursing Education

- ▶ Faculty development
- ▶ Mentoring
- ▶ Peer review of test questions

# Limitations

- ▶ Unequal sample sizes between groups

# Recommendations

- ▶ Repeat study with equal group sizes
  - ▶ Fewer groups
  - ▶ Equal range for group years
  - ▶ Participants self-identify skill level
- ▶ Refine results to specific areas of evidence-based testing
  - ▶ Test development
  - ▶ Item analysis
  - ▶ Test revision

# Recommendations

- ▶ More research needed regarding characteristics of educators who consistently implement evidence-based testing practices
- ▶ Further studies needed to compare implementation of evidence-based testing based on:
  - ▶ Educational background
  - ▶ Faculty development



Questions?

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