

“WHAT HAPPENED ON THE EXAM?” A Metacognitive Strategy to Improve Performance

Jessica Gay, MSN, RNC, CNE
Kathryn Kuskie, MS, CNM, CHSE
and Alisha Loken, MSN, RN, CCRN, CNE



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COI Disclosure

- ▶ The presenters have no financial conflicts of interest to disclose concerning this presentation



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The Team

- ▶ Jessica Gay, MSN, RNC–MNN, CNE
 - University of Kansas (Kansas City, Kansas)
 - Jgay2@kumc.edu
- ▶ Kathy Kuskie, MS, CNM, CHSE
 - Linfield University (Portland, Oregon)
 - Kkuskie@linfield.edu
- ▶ Alisha Loken, MSN, RN, CCRN, CNE
 - Bakersfield College (Bakersfield, California)
 - Aloken@bakersfieldcollege.edu



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Objectives

- ▶ Participants will:
 - Explore the use of a metacognitive exam wrapper tool for guided exam review
 - Consider evidence to support the use of exam wrappers in nursing education
 - Discuss potential benefits to students and faculty

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The Problem

- ▶ Student diversity is increasing in nursing
- ▶ Exam performance is an area of concern
- ▶ Nursing students often struggle with test-taking skills
 - Particularly if they are part of an underrepresented group (Brown, et al., 2014; Harding, 2012; Jeffreys, 2015)
- ▶ High achievers struggle too
- ▶ Demonstrated lack of metacognitive skills

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What is metacognition?

- ▶ Metacognition: a person's "awareness and understanding of one's own thought processes" (Oxford University Press, 2022, entry 1)
- ▶ Metacognitive skills can provide learners with
 - Insight about what strategies are likely to be effective (Flavell, 1979)
 - The foundation for an effective strategy for exam performance (Williams, 2021)
 - When used to assess thinking and behavior patterns during exams
 - A growth mindset and possibility for change (Muñiz et al., 2022)

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One Solution: Exam Wrapper

- ▶ **A metacognitive tool for exam review** (Achacoso, 2004; Carpenter et al., 2020; Edlund, 2020; Havis, 2018; Poorman & Mastorovich, 2016; Williams, 2021)
 - Students think about how they approach exam items cognitively
 - Leads to changes in preparation
- ▶ Leverages awareness and accountability of the student
- ▶ Discussed in the literature as a promising intervention to address exam performance in higher education

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Exam Wrappers in the Literature

- ▶ Various models: before/after, students complete **independently** (Carpenter et al., 2020; Edlund, 2020; Swalve et al., 2021; Williams, 2021)
 - Not done one-on-one with a faculty
 - Subjective vs. objective
- ▶ Student perception studied but not faculty perception
- ▶ Rarely studied in nursing education

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Site: University of Kansas SON BSN

- ▶ On campus face-to-face (Traditional) BSN program
 - 4 semesters; Fall/Spring only
- ▶ Publicly funded University
- ▶ Cohorts 125–139 each
- ▶ Admit once per year in Fall
- ▶ Holistic admissions implemented 2019



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Exam Wrappers for Exam Review

- ▶ One-on-one meeting with individual student and faculty
- ▶ Use the exam wrapper tool to review missed questions and examine thinking (metacognition) when answering
- ▶ Assess findings for patterns
- ▶ Make recommendations to address individual needs
 - Study strategies, Test-taking strategies
 - Referrals: Educational Support/Learning Specialists, Counseling Center, ADA Office

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Exam Wrapper Tool

Question #	I changed my answer	I added a "what if scenario" to the test question	I misread the question	I misunderstood the question (what it was asking)	I did not know or understand all the words in the question (vocabulary)	I did not know the content

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Exam Wrapper Tool

Question #	I changed my answer	I added a "what if scenario" to the test question	I misread the question	I misunderstood the question (what it was asking)	I did not know or understand all the words in the question (vocabulary)	I did not know the content
8	X					
11						X
29						X
33						X
34			X			
36			X			
46	X					
51					X	
62			X			

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Research Project

A Study about Exam Wrappers

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Research Methods

- ▶ **Quantitative Data Analysis**
 - Analyze exam scores before and after visit using exam wrapper tool
- ▶ **Qualitative Survey/Interviews**
 - Examine the experiences and perceptions of nursing students and nursing faculty

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Research Questions

1. Does the collaborative use of a metacognitive exam review tool result in improved exam scores for students in undergraduate nursing courses?
2. What are nursing student and nursing faculty experiences and perceptions about the usefulness of the metacognitive tool for exam review and to improve exam performance?

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Sampling and Procedures:

- ▶ Two junior level undergraduate nursing courses examined
 - First two semesters in professional program
- ▶ Faculty modified and used a metacognitive tool from literature (Williams, 2021) for exam review in one-on-one meetings with students
- ▶ Fall 2021, Spring 2022, Fall 2022, and Spring 2023

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Quantitative

Data Analysis and Results

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Quantitative Data Analysis

- ▶ N=91 students in two nursing courses participated in exam review with faculty; exam scores analyzed
 - Two junior-year UG nursing courses examined over 2 years/2 cohorts
- ▶ Exam scores pre- and post- exam review meeting analyzed for differences

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Significant Findings

- ▶ All students (n = 91)
 - Exam scores improved an average of **8.22 points**
 - Paired t-test (one-tailed): 95% confidence interval (6.91, 9.51).
 - Gain is statistically significant at $p < .05$, critical value is 1.66, $t = 12.54$
- ▶ Students below 75% (n = 53)
 - Exam scores improved an average of **11.27 points**
 - Paired t-test (one-tailed): 95% confidence interval (9.80, 12.74).
 - Gain is statistically significant at $p < .05$, critical value is 1.66, $t = 5.36$
- ▶ Students above 75% (n = 38)
 - Exam scores improved an average of **3.96 points**
 - Paired t-test (one-tailed): 95% confidence interval (2.38, 5.53).
 - Gain is statistically significant at $p < .05$, critical value is 1.66, $t = 5.10$

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Significant Findings

- ▶ Students with 2 visits in one semester (n=12)
 - Repeated measures ANOVA
 - Exam 3 scores improved an average of **11.27 points**
 - 95% confidence interval (6.74, 15.19).
 - Gain is statistically significant at $p < .05$ from Exam 1 to Exam 3, but not from Exam 1 to Exam 2
 - Did not reach level of significant until after 2nd visit (sample size?)
 - *Power analysis = 28 minimum sample*

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Conclusion

- ▶ Use of the exam wrapper one-on-one with faculty leads to significant improvement in exam scores.

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Qualitative Data Analysis and Results

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Qualitative: Qualitative Descriptive Design

Faculty (N=3)

- ▶ Semi-structured interviews

Students (N=8)

- ▶ Open-ended REDCap survey
- ▶ Collected demographics
- ▶ Used student-created pseudonyms for privacy

Comparative analysis of data for consistent themes

- ▶ Language usage of participants --> 6 Themes Identified

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Themes

- ▶ **Helpful:** Both faculty and student cases agree; all participants affirmative
- ▶ **Builds confidence:** Students understand true cause of problem rather than guessing or assuming
- ▶ **Diagnostic:** Identifies the reason(s) for poor exam performance; Allows for plan to address including appropriate referrals
- ▶ **Promotes ownership:** Accountability/responsibility of students; Behavior change required to improve; individualized
- ▶ **Provides framework:** Guides faculty-student interaction; Problem-solving tone; collaborative effort
- ▶ **Time-intensive:** Positive and negative aspects; Faculty burden (1 hour each student meeting); Worthwhile investment

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Supporting Quotes from Students

- ▶ "It helped me break down each question and understand why I missed the question, it helped me evaluate my results, and know what needs to be changed to benefit myself in the next exam."
- ▶ "It [the tool] identifies your strengths and weaknesses and the different patterns. It made me aware that I was changing my answers a lot and that I knew the majority of the content".
- ▶ "It made me realize that I needed to change my study habits. I feel like if I had never had that encounter with the faculty, my grades would not have improved as much as they did. It was a wakeup call for me. I was able to gain confidence in answering questions and I stopped going back to change my answers."

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Supporting Quotes from Faculty

- ▶ "I really liked the fact that it [using the tool] makes it puts the responsibility back on the student, as an adult learner. Then it feels like they can take some ownership."
- ▶ "But then we go that step further as to what were you thinking that made you choose that other answer, you know? I think that's been the beneficial part."
- ▶ "It [the tool] helps us give them better instruction on how to take a test and what to do in that area."

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Conclusion

Themes indicate that students and faculty found the exam wrapper to be useful and beneficial for exam review.

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What happens next?
Implications and Future Research

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Implications for Nursing Education

- ▶ The exam wrapper is useful and provides structure for an exam review with faculty.
- ▶ The tool is well-received by both students and faculty.
- ▶ Exam scores improve significantly with use of an exam wrapper in the one-on-one student/faculty setting.
- ▶ The exam wrapper is economical, user-friendly, adaptable, and effective.

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Future Research

- ▶ More research is needed
 - Multiple implementation models
 - Larger sample size
 - More diverse sample
 - Students
 - Institutions and program types

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Thank You!

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