



Enhancing clinical mathematics proficiency of nursing students through heuristic-based learning packets: A quantitative evaluation

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ABSTRACT

Mathematics plays a vital role in nursing practice, as it supports essential tasks such as medication administration, fluid management, and the accurate interpretation of patient data. However, nursing students often struggle to apply mathematical concepts in clinical settings where quick and accurate decisions are crucial. The study explores a heuristic way to help students become more confident and capable in using mathematics to ensure safe and effective patient care. A learning intervention was conducted among nursing students using specially designed packets incorporating heuristic strategies for understanding clinical mathematics. Data collected before and after the intervention were analyzed to identify meaningful improvements in their skills, with results handled under strict ethical and privacy guidelines. The results showed significant improvements in students' performance in clinical mathematics after using heuristic-based learning materials. These gains were consistent across key areas such as unit conversion, dosage calculation, fluid balance, and data interpretation. The findings confirm that focused and contextual instruction can meaningfully support nursing students in developing the skills necessary for safe and effective patient care.

Keywords: clinical mathematics, heuristic-based education, nursing practice, nursing education, mathematical education

INTRODUCTION

Background of the Study

Mathematical skills are essential in clinical practice, especially nursing, where precise calculations can directly impact patient outcomes (Ogbonnaya & Awoniyi, 2021). Nurses are often responsible for administering medications, managing intravenous fluids, and interpreting medical data, all requiring accuracy and confidence in mathematical computations (Taja-on et al., 2024). Their role as primary caregivers places them

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Table of Contents Mathematics For Nursing Science A Programmed Text

1. Understanding the eBook Mathematics For Nursing Science A Programmed Text
 - The Rise of Digital Reading Mathematics For Nursing Science A Programmed Text
 - Advantages of eBooks Over Traditional Books
2. Identifying Mathematics For Nursing Science A Programmed Text
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Mathematics For Nursing Science A Programmed Text
 - User-Friendly Interface
4. Exploring eBook Recommendations from Mathematics For Nursing Science A Programmed Text
 - Personalized Recommendations
 - Mathematics For Nursing Science A Programmed Text User Reviews and Ratings
 - Mathematics For Nursing Science A Programmed Text and Bestseller Lists
5. Accessing Mathematics For Nursing Science A Programmed Text Free and Paid eBooks
 - Mathematics For Nursing Science A Programmed Text Public Domain eBooks
 - Mathematics For Nursing Science A Programmed Text eBook Subscription Services
 - Mathematics For Nursing Science A Programmed Text Budget-Friendly Options
6. Navigating Mathematics For Nursing Science A Programmed Text eBook Formats
 - ePub, PDF, MOBI, and More
 - Mathematics For Nursing Science A Programmed Text Compatibility with Devices
 - Mathematics For Nursing Science A Programmed Text Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Mathematics For Nursing Science A Programmed Text
 - Highlighting and Note-Taking Mathematics For Nursing Science A Programmed Text
 - Interactive Elements Mathematics For Nursing Science A Programmed Text
8. Staying Engaged with Mathematics For Nursing Science A Programmed Text

- Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Mathematics For Nursing Science A Programmed Text
9. Balancing eBooks and Physical Books Mathematics For Nursing Science A Programmed Text
- Benefits of a Digital Library
 - Creating a Diverse Reading Collection Mathematics For Nursing Science A Programmed Text
10. Overcoming Reading Challenges
- Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Mathematics For Nursing Science A Programmed Text
- Setting Reading Goals Mathematics For Nursing Science A Programmed Text
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Mathematics For Nursing Science A Programmed Text
- Fact-Checking eBook Content of Mathematics For Nursing Science A Programmed Text
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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