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# Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Nursing Students

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**Consultancy Project  
Executive Summary**

Organization: Gardner-Webb University School of Education

Project Title: Investigating Aromatherapy as a Test Anxiety Intervention  
for Undergraduate Nursing Students

Candidate: Brittany Graham

Consultancy Coach: Jeffrey Hamilton, EdD

Defense Date: November 5, 2018

Authorized by: Tracy Arnold, DNP, RN

### **Amendment History**

<u>Version</u>	<u>Issue Date</u>	<u>Changes</u>
Version 1	8/7/2018	Initial version
Version 2	8/27/2018	Site advisor made content recommendations and APA 6 <sup>th</sup> edition formatting revisions
Version 3	10/7/2018	Editor made formatting recommendations

## Approval

This consultancy project was submitted by Brittany Graham under the direction of the persons listed below. It was submitted to Gardner-Webb University School of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Gardner-Webb University.

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Jeffrey Hamilton, Faculty Advisor  
Gardner-Webb University

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Date

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Tracy Arnold, Site Advisor  
Associate Dean, Hunt School of Nursing

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Date

## **Acknowledgements**

The past 3 years have simply been incredible—so much has happened, so much has changed, but one thing remained the same: the support I received. First and foremost, I want to praise my Lord and Savior Jesus Christ for all He has done for me. You were there during this whole program; and I am ever grateful for your unending love, mercy, and kindness that you bestow upon me. Next, I want to thank my husband Rusty for his love and support along the way. Rus—this is where our journey began and Lord willing, it will continue on and just get even better from here. I love you! I also want to acknowledge all of my family, church family, and friends for your unending love, prayers, and support—especially you Mom. You have ALWAYS been my biggest fan, and I would be lost without you. Thank you for inspiring me to chase my dreams! I love you! To my fur children: Ernest, Elvis, and Giovanni—thank you for being so loving, kind, and patient with your “Mommy” as she completed her doctorate. I love you all! Thank you also to all of my DEOL professors, my professor and consultancy coach Dr. Jeffrey Hamilton, and my colleague and site advisor Dr. Tracy Arnold—you all have been such a help and blessing to me! Last, but certainly not least, I want to say a special thank you to my daughter. Julieanna—at the time I wrote this, you were waiting to make your debut in this world; however, that did not keep you from having an impact during this process. You, my darling, have inspired me to try harder, do my best work, and make you proud of me. I pray that I will always set a good Godly example for you, and I encourage you to chase your dreams just like your Mommy and Daddy did. Thank you for being the sweet angel you are! I love you! (Proverbs 4:7 KJV)

## **Abstract**

Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Nursing Students. Graham, Brittany, 2018, Consultancy Project, Gardner-Webb University, Digital Commons/Aromatherapy/Nursing Student Stress/Nursing Student Test Anxiety/Nursing Students

This project seeks to explore the concept of aromatherapy as an intervention for undergraduate nursing student test anxiety in greater depth. Test anxiety is significant in nursing education because of the high stakes weight of exams and difficulties associated with answering multiple choice and multiple response questions. Historically, the Hunt School of Nursing has not provided specific procedures or interventions to assist students with test anxiety; however, this project seeks to outline a pathway for the development and achievement of a successful aromatherapy program for undergraduate students. On an informal trial basis, the use of aromatherapy lotions prior to exams has initiated a positive instructor and student professional relationship and a positive response to the use of essential oil-based lotions. A literature search yielded aromatherapy as an appropriate and effective intervention for the management of nursing student test anxiety. Future implications for this project may involve managing graduate student test anxiety, development of a calming room for students to assist with clearing the mind before an exam, and implementation of the project by the Hunt School of Nursing or Gardner-Webb University as a whole.

## Table of Contents

1	Introduction .....	1
	1.1 Project Purpose .....	1
	1.2 Associated Documents .....	1
	1.3 Project Plan Maintenance .....	1
2	Project Scope .....	2
	2.1 Outline of Partnering Organization’s Objectives .....	2
	2.1.1 Objectives .....	2
	2.1.2 Success Criteria .....	5
	2.1.3 Risks .....	5
	2.2 Outline of Student’s Objectives .....	5
	2.2.1 Objectives .....	5
	2.2.2 Success Criteria .....	6
	2.2.3 Risks .....	6
	2.3 Definitive Scope Statement .....	6
3	Deliverables .....	7
	3.1 To Partnering Organization .....	7
	3.2 From Student .....	8
4	Project Approach .....	9
	4.1 Project Lifecycle Processes .....	9
	4.2 Project Management Processes .....	9
	4.3 Project Support Processes .....	10
	4.4 Organization .....	10
	4.4.1 Project Team .....	10
	4.4.2 Mapping Between the Hunt School of Nursing and Student .....	10
5	Communications Plan .....	12
6	Work Plan .....	14
	6.1 Work Breakdown Structure .....	14
	6.2 Resources .....	14
7	Milestones .....	16
8	Metrics and Results .....	17
9	Risks, Constraints, Assumptions .....	19
	9.1 Risks .....	19
	9.2 Constraints .....	21
	9.3 Assumptions .....	21
10	Financial Plan .....	24
11	Quality Assurance Plan .....	26
	References .....	29
	Appendix .....	31

## 1 Introduction

### 1.1 Project Purpose

“Imagine the following scenario. You are taking a test, but you know that you cannot make any mistakes. If you fail the test, you will have to leave the course” (Røykenes, Smith, & Larsen, 2014, p. 350). This is a common scenario that nursing students face. In most cases, a significant failure on an exam can lead to failure in a course. This project intendeds to reduce test anxiety as perceived by undergraduate nursing students. “Test anxiety (TA) is a common response to the stress of academic examinations” (Brodersen, 2017, p. 131). Further, Brodersen (2017) noted aromatherapy as an applicable intervention for test anxiety, and further research is necessary in this topic. “Regardless of the fairness and appropriateness of an exam and a student’s motivation to do well on it, TA may be severe enough to impair exam performance for some students” (Brodersen, 2017, p. 135). If test anxiety is not managed properly, it can have adverse consequences on a nursing student’s success. This project would provide guidelines and an intent to assist with alleviation of test anxiety. Overall, “Nurse educators need to be aware of evidence-based interventions for TA and recognize when it would be appropriate and feasible to use them” (Brodersen, 2017, p. 135). Multiple choice exams are administered in various undergraduate nursing classes in the Hunt School of Nursing. Research has shown that “Test-taking anxiety effects the students’ exam scores negatively” (Cürçani, Küçüköğlü, & Tan, 2015, p. 52). This project seeks to provide students the opportunity to use aromatherapy-based products for the intent of alleviating test anxiety. Ultimately, it is the desire of the doctoral student that the expected outcome of the project would be to reduce test anxiety for all students within the Hunt School of Nursing who take exams.

### 1.2 Associated Documents

- Appendix A: Hunt School of Nursing Aromatherapy Policy: A draft of a potential policy to be adopted by the Hunt School of Nursing.
- Appendix B: Westside Test Anxiety Scale: A potential quantitative tool to measure student test anxiety to be used by the Hunt School of Nursing.
- Appendix C: Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Nursing Students Follow-Up Questions: A potential qualitative tool to measure student perception of aromatherapy as an intervention for managing test anxiety.

### 1.3 Project Plan Maintenance

The Project Plan was evaluated as each project milestone was completed. Each milestone was evaluated and approved by Dr. Jeffrey Hamilton.



## 2 Project Scope

The mission of the Hunt School of Nursing is to enhance the health status of the global community by preparing individuals to practice holistic and professional nursing through the provision of student centered programs of study for a diverse student population that promotes academic excellence within a Christian, private, liberal arts setting utilizing teamwork and community engagement (Gardner-Webb University Hunt School of Nursing, 2018, p. 7).

This project would correlate with the Hunt School of Nursing mission statement by adhering to “the provision of student centered programs of study for a diverse student population” (Gardner-Webb University Hunt School of Nursing, 2018, p. 7).

Aromatherapy is a student-centered intervention in that it may potentially assist with relaxation and may allow students to better focus and channel positive energy prior to an exam.

### 2.1 Outline of Partnering Organization’s Objectives

#### 2.1.1 Objectives

The Gardner-Webb University Hunt School of Nursing did not advertise any project needs nor specifically seek the doctoral student to complete a project, thus there were no specific objectives from the partnering organization; however, the program outcomes for undergraduate students can be connected with the project. Table 1 illustrates a list of program outcomes and their relationship with the project.

Table 1

#### *Partnering Organization’s Objectives*

Program Outcomes	Project Relationship
<p>The Associate of Science in Nursing (ASN) program seeks to meet the following program outcomes:</p> <ol style="list-style-type: none"> <li>1. Student performance on the NCLEX-RN will be at or above the national pass rate.</li> <li>2. 60% of students entering the program will graduate within 1.5 times the length of the program.</li> </ol>	<p>The Anxiety and Depression Association of America ([ADAA], 2016) discusses common causes of test anxiety. These include fear of failure, lack of preparation, and poor test history (ADAA, 2016). Nursing students are often faced with high-stakes testing and high standards to maintain a passing grade in their courses. These factors often lead to test anxiety. This project will attempt to address the issue of test anxiety. Aromatherapy is an appropriate intervention to practice relaxation techniques to “invigorate your body and will allow you to better focus on the exam” (ADAA, 2016, para. 4).</p>

<p>3. 80% of graduates will achieve employment as a RN within 6 months of graduation.</p> <p>(Gardner-Webb University Hunt School of Nursing, 2018, p. 13).</p>	
<p>The graduate of the ASN program will:</p> <ol style="list-style-type: none"> <li>1. Utilize critical thinking, quality improvement, and informatics to provide safe, evidence based, holistic nursing care.</li> <li>2. Collaborate effectively with clients, families, and the interdisciplinary team to ensure continuous, high quality, client-centered care.</li> <li>3. Manage the delivery of nursing care with respect to diverse cultures and belief systems for client populations in varied health care settings.</li> <li>4. Execute professional nursing care adhering to principles of the American Nurses Association (ANA) nursing code of ethics and standards of practice.</li> </ol> <p>(Gardner-Webb University Hunt School of Nursing, 2018, p. 13).</p>	<p>This project would correlate with the Hunt School of Nursing philosophy based-on the nursing metaparadigm concepts of person, health, and environment. Alleviation of test anxiety would denote a respect for persons in that the project considers individual feelings associated with test anxiety. Next, this project would contribute to psychological well-being because it addresses the issue of anxiety related to testing. Last, a student-centered environment would consider test anxiety as a genuine entity that students need help mastering.</p>
<p>The BSN program seeks to meet the following program outcomes:</p>	<p>This project may introduce methodologies for managing test anxiety and assist students with being successful for their licensure examination. In addition, an environment of higher anxiety “deserves attention and intervention so students can apply their knowledge skillfully in an</p>

<p>1. Student performance on the NCLEX-RN will be at or above the national pass rate.</p> <p>2. 80% of students entering the program will graduate within 1.5 times the length of the program.</p> <p>3. 80% of graduates will achieve employment as a RN within 6 months of graduation.</p> <p>(Gardner-Webb University Hunt School of Nursing, 2018, p. 18).</p>	<p>environment that is supportive and conducive to learning, which will facilitate success and increase retention” (Moscaritolo, 2009, p. 17).</p>
<p>The graduate of the BSN program will:</p> <p>1. Utilize critical thinking, quality improvement, and informatics to provide safe, evidence based, holistic nursing care.</p> <p>2. Collaborate effectively with clients, families, and the interdisciplinary team to ensure continuous, high quality, client-centered care.</p> <p>3. Manage the delivery of nursing care with respect to diverse cultures and belief systems for client populations in varied health care settings.</p> <p>4. Execute professional nursing care adhering to principles of the American Nurses Association (ANA) nursing code of ethics and standards of practice.</p>	<p>This project would correlate with the Hunt School of Nursing philosophy based-on the nursing metaparadigm concepts of person, health, and environment. Alleviation of test anxiety would denote a respect for persons in that the project considers individual feelings associated with test anxiety. Next, this project would contribute to psychological well-being because it addresses the issue of anxiety related to testing. Last, a student-centered environment would consider test anxiety as a genuine entity that students need help mastering.</p>

<p>5. Utilize leadership, research, and service to provide evidence-based nursing care to diverse populations using knowledge of current healthcare policies.</p> <p>(Gardner-Webb University Hunt School of Nursing, 2018, p. 18).</p>	
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### 2.1.2 Success Criteria

Success on behalf of the partnering organization was not measured. Future implications for success criteria may include increased student satisfaction, decreased student test anxiety, higher performance on examinations, and organizational modeling for utilizing interventions for managing undergraduate nursing student test anxiety.

### 2.1.3 Risks

Key risks associated with failure to implement this project include the following: (a) test anxiety experienced by the students, (b) either a positive or negative effect on a student's course grade, (c) possible effect on licensure examination pass rates, and (d) unknown effects of stress, anxiety, or depression on student learning outcomes.

## 2.2 Outline of Student's Objectives

### 2.2.1 Objectives

The objectives for the project are as follows:

- 1) Develop an aromatherapy intervention program for undergraduate nursing students
  - a. The doctoral candidate allowed students to trial the intervention on an informal basis and received positive feedback. The doctoral candidate also created a policy draft to share with faculty.
- 2) Reduce undergraduate nursing student test anxiety
  - a. There have been no formal attempts to assess or measure effectiveness of the intervention due to Institutional Review Board (IRB) restrictions.
- 3) Engage faculty in promoting aromatherapy as an intervention for undergraduate nursing student test anxiety.
  - a. Several faculty members are using aromatherapy-based products as an intervention for reducing test anxiety.

### **2.2.2 Success Criteria**

Success on behalf of the doctoral student was based on completion of the doctoral student's project objectives. Objective 1 was met through an informal trial of use of aromatherapy lotions. Objective 2 is still in progress due to IRB rejection of the study. Objective 3 is still in progress due to incomplete adoption of the project by the Hunt School of Nursing.

### **2.2.3 Risks**

Key risks associated with this project include the following: (a) mild test anxiety, (b) failure to gain IRB approval, (c) local skin reaction or systemic reaction, (d) negative perception of aromatherapy by faculty, and (e) negative perception of aromatherapy by students. These risks are further described and documented in Section 9 of this document.

## **2.3 Definitive Scope Statement**

This project would correlate with the Hunt School of Nursing philosophy based on the nursing metaparadigm concepts of person, health, and environment. "The person, made in the image of God, is unique and whole in the moment, deserving of love and respect; person is defined as an individual, family, or population seeking or entitled to optimal health" (Gardner-Webb University Hunt School of Nursing, 2018, p. 8). Alleviation of test anxiety would denote a respect for persons in that the project considers individual feelings associated with test anxiety. Next, "Health is an ever-changing state of biological, psychological, social and spiritual well-being" (Gardner-Webb University Hunt School of Nursing, 2018, p. 8). This project would contribute to psychological well-being because it addresses the issue of anxiety related to testing. Last, "The environment for health includes the internal environment of feelings and meanings, as well as the external physical and sociopolitical climate that influences how care is accessed and experienced" (Gardner-Webb University Hunt School of Nursing, 2018, p. 8). A student-centered environment would consider test anxiety as a genuine entity that students need help mastering. This project would open a gateway to those options.

### 3 Deliverables

#### 3.1 To Partnering Organization

For this project, deliverables to the partnering organization included project approval, resource identification, communication, implementation, and ongoing modification of the project. Table 2 illustrates a list of deliverables to the partnering organization, due dates, and if they were estimated or contracted. The organization reserves the right to approve or reject the project based on feasibility and current needs of the faculty and students.

Table 2

#### *Deliverables to Partnering Organization*

<b>Deliverables</b>	<b>Due Date</b>	<b>Estimated or Contracted</b>
1) Project Approval a. Organizational administration approached with project idea b. Organizational administrative approval of project	May 2018	Estimated
2) Resource Identification a. Organization will need a monetary budget for successful implementation of the project b. Site Advisor appointed	a. Ongoing b. May 2018	Estimated
3) Communication a. Organizational administration and doctoral student will communicate plan for integration of project	August 2018 or January 2019	Estimated
4) Implementation a. Organization will implement project	January 2019	Estimated
5) Modification a. Organization will modify project as needed to meet faculty and student needs	Ongoing	Estimated

### 3.2 From Student

For this project, deliverables from the student included project development, literature research, communication, and ongoing modification of the project. Table 3 illustrates a list of deliverables to the partnering organization, due dates, and if they were estimated or contracted.

Table 3

#### *Deliverables from Student*

<b>Deliverables</b>	<b>Due Date</b>	<b>Estimated or Contracted</b>
1) Project Development <ul style="list-style-type: none"> <li>a. Student will complete a policy draft for the organization to use for implementation</li> <li>b. Student will discuss project development and feasibility with Site Advisor and Consultancy Coach</li> </ul>	<ul style="list-style-type: none"> <li>a. May 2018</li> <li>b. August 2018</li> </ul>	Estimated
2) Literature Research <ul style="list-style-type: none"> <li>a. Student will complete a comprehensive literature review based on the project topic</li> </ul>	August 2018	Estimated
3) Communication <ul style="list-style-type: none"> <li>a. Student will communicate with Site Advisor and Consultancy coach regarding the status of the project, opportunities, and challenges as they develop</li> </ul>	December 2018	Estimated
4) Modification <ul style="list-style-type: none"> <li>a. Student will modify original project for implementation on an as needed basis</li> </ul>	October 2018	Contracted (due to graduation date)

## **4 Project Approach**

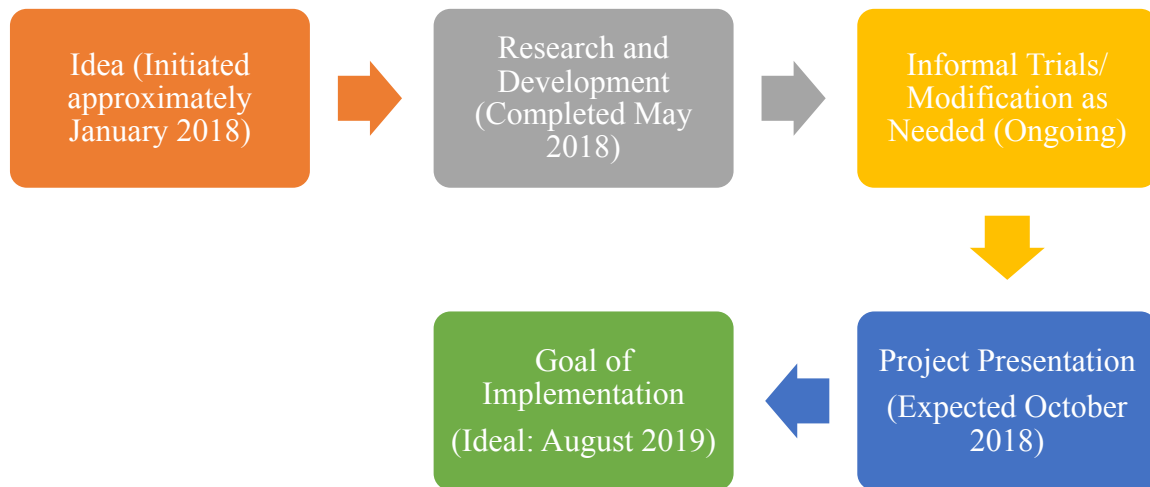
### **4.1 Project Lifecycle Processes**

According to Turner and McCarthy (2017), “Nursing is a demanding profession with prolonged levels of stress.... Increased stress begins in nursing school” (p. 21). The doctoral student experienced a first-hand account of test anxiety related to nursing school due to the stringent policies and demands of the curriculum within a short time period. This experience was influential in the doctoral student’s career choice and academic goals. The project began as an informal process during the summer of 2017. Several instructors would allow students to use aromatherapy-based products to assist with managing test anxiety due to the increased stressors associated with a shorter semester. The doctoral student adopted this process moving forward and purchased a variety of lotions for students to use. During this time frame, the doctoral student had an epiphany and began development of the project: “Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Students.” The idea was discussed with the Hunt School of Nursing Prelicensure Program Chair, then with the Consultancy Coach. A detailed proposal was presented to the Dean of the Hunt School of Nursing and was approved. The doctoral student began an in-depth literature review of articles on the topic of nursing student test anxiety and aromatherapy. In addition, the doctoral student drafted a policy for regulation of aromatherapy and shared it with the Prelicensure Chair. A project Site Advisor was recommended by the Dean of the Hunt School of Nursing. The Site Advisor accepted the request by the doctoral student. The doctoral student provided the Site Advisor with an overview of the consultancy project and the Site Advisor assisted with organizing and submitting appropriate documentation for IRB approval. Anticipated communication will involve follow-up with the Consultancy Coach, follow-up with the Site Advisor, discussion of implementation with the Prelicensure Chair, and discussion of a more formal implementation with the Hunt School of Nursing faculty. It is the desire of the doctoral student that the project will be reviewed, adopted, and implemented by the Hunt School of Nursing to potentially address the need to manage nursing student test anxiety.

### **4.2 Project Management Processes**

This project has been a mostly independent work of the doctoral student. Some management and guidance has been provided by the Consultancy Coach and Site Advisor. The responsibility of the doctoral student included research, development, and a future presentation. This project may or may not be implemented based on the decision of the Hunt School of Nursing administration and faculty; however, it will be in a presentable format for consideration of implementation. Figure 1 outlines the cycle and management process of the project as conducted by the doctoral student.





*Figure 1.* Project Management Process. This figure illustrates the management process of the project as anticipated by the doctoral student.

### 4.3 Project Support Processes

The doctoral student coordinated with appropriate individuals on an as-needed basis to ensure each component of the consultancy project was completed.

### 4.4 Organization

Organization and mapping of the project consisted of connections with the doctoral student and organization as well as oversight by all members of the project team.

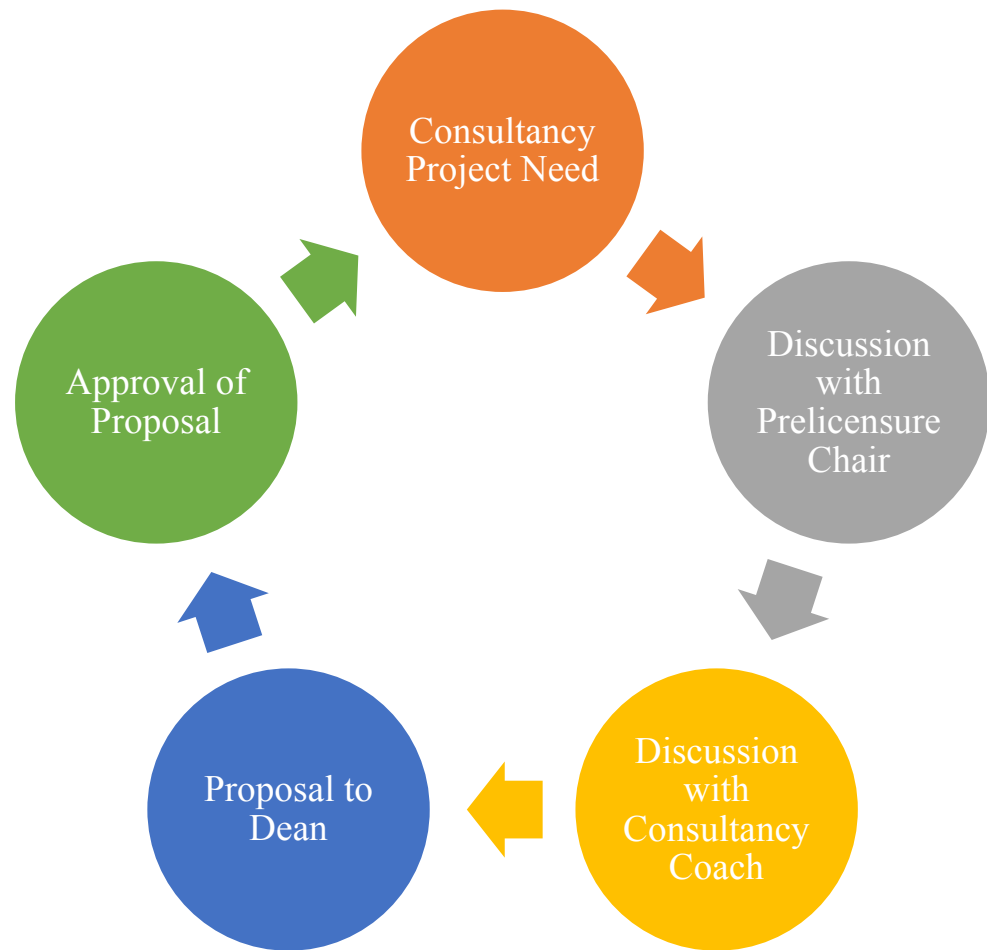
#### 4.4.1 Project Team

There was an informal project organization structure to accomplish work related to completion of the project. The team consisted of the doctoral student, the Site Advisor, the Consultancy Coach, and the organizational administration of the Hunt School of Nursing. The doctoral student was responsible for development and research related to the project. The Site Advisor and Consultancy Coach provided guidance and support to the doctoral student as well as project oversight. Last, the organizational administration reviewed the doctoral student's project proposal and granted approval.

#### 4.4.2 Mapping Between the Hunt School of Nursing and Student

The organization began as an employer of the doctoral student and then became the client of the doctoral student. Although the doctoral student

remains an employee of the organization, the relationship between the organization mapped into a non-employee pathway/consultant viewpoint to develop the project. Figure 2 outlines the project mapping approach and connection between the Hunt School of Nursing and the doctoral student.



*Figure 2.* Project Mapping Process. This figure illustrates the project mapping approach used by the doctoral student.

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## 5 Communications Plan

During the life cycle of this consultancy project, there were specific individuals with whom the doctoral student needed to communicate. Any potential change introduced within an organization must be supported with effective communication. Table 4 illustrates a detailed communications plan that was used during the project.

Table 4

### *Communications Plan*

<b>Stakeholder</b>	<b>Information Exchanged</b>	<b>Why Needed</b>	<b>Due Date</b>	<b>Method Obtained</b>
Consultancy Coach	<ul style="list-style-type: none"> <li>• Milestone feedback</li> <li>• IRB feedback</li> <li>• Project overview</li> <li>• Guidance</li> </ul>	<ul style="list-style-type: none"> <li>• Development of project</li> <li>• Protection of research subjects</li> <li>• Feasibility and relevance of project</li> <li>• Support for doctoral student</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic communication</li> <li>• Telephone communication</li> <li>• Verbal communication</li> </ul>
Doctoral Student	<ul style="list-style-type: none"> <li>• Project idea</li> <li>• Research findings</li> <li>• Policy draft development</li> </ul>	<ul style="list-style-type: none"> <li>• Finding an appropriate consultancy project</li> <li>• Supporting project scope, goals, life cycle, etc.</li> <li>• Assist with preparing for potential implementation of project</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic communication</li> <li>• Telephone communication</li> <li>• Verbal communication</li> </ul>
Organizational Administration	<ul style="list-style-type: none"> <li>• Project approval</li> <li>• Policy draft feedback</li> <li>• Project implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Support for doctoral student</li> <li>• Appropriateness of policy</li> <li>• Support for undergraduate nursing students</li> </ul>	<ul style="list-style-type: none"> <li>• May 2018</li> <li>• Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic communication</li> <li>• Verbal communication</li> </ul>

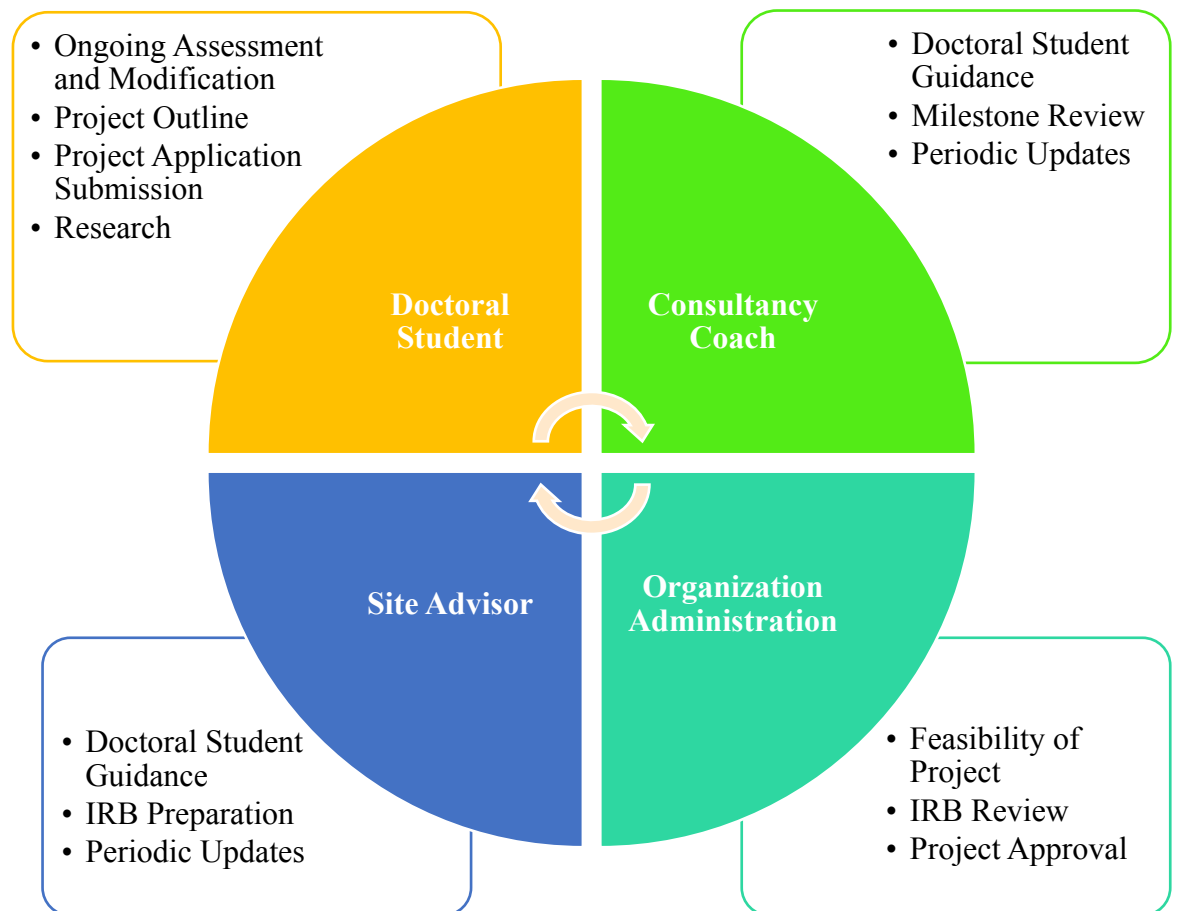
Site Advisor	<ul style="list-style-type: none"><li>• Milestone feedback</li><li>• IRB feedback</li><li>• Project overview</li><li>• Guidance</li></ul>	<ul style="list-style-type: none"><li>• Development of project</li><li>• Protection of research subjects</li><li>• Feasibility and relevance of project</li><li>• Support for doctoral student</li></ul>	<ul style="list-style-type: none"><li>• May 2018</li><li>• Ongoing</li></ul>	<ul style="list-style-type: none"><li>• Electronic communication</li><li>• Telephone communication</li><li>• Verbal communication</li></ul>
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## 6 Work Plan

During the life cycle of this project, there were multiple tasks undertaken and delegated as appropriate. In addition, there were multiple resources used to facilitate the work plan of this project. Overall, a dynamic combination of resources and work made the development of the project possible.

### 6.1 Work Breakdown Structure

Throughout the project, work needed to be monitored and controlled. Figure 3 illustrates the work breakdown structure used for the “Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Students” project.



*Figure 3.* Work Breakdown Structure. This figure illustrates the work breakdown structure used for the project.

### 6.2 Resources

Some resources the project required included the following:

- 1) Acquisition of Resources: To trial the project on an informal basis, aromatherapy lotions were needed
  - 2) Consultancy Coach Involvement: To monitor the development of the project, the doctoral student required communication with the assigned Consultancy Coach
  - 3) Doctoral Student Engagement: For research and development of the project, the doctoral student was required to identify a project need and be committed and engaged to overseeing project completion
  - 4) Site Advisor Involvement: To monitor the development of the project, the doctoral student required acquisition of and communication with the Site Advisor

## 7 Milestones

The planning process for this project began in January 2018. Table 5 illustrates a list of milestones and tracking information associated with each of the milestones as they developed.

Table 5

### *Milestone Tracking*

<b>Milestone Number</b>	<b>Title</b>	<b>Forecast Date</b>
1	Consultancy Concept and Purpose	January 2018
2	Consultancy SMART Objectives	January 2018
3	Scope, Boundaries, Organizations, Processes, and Systems Impacted	May 2018
4	Summary of the Business Benefits	May 2018
5	Risk Assessment	May 2018
6	Summary of the Key Facts	August 2018
7	Outline of Project Plan	August 2018
8	Budget Estimate	August 2018
9	Quality Assurance Plan	August 2018
10	Track and Document Overall Plan Performance	December 2018/Ongoing

## 8 Metrics and Results

A proposal for a formal study for this project was submitted by the doctoral student and Site Advisor to the Institutional Review Board (IRB) in May 2018. The project was rejected by the IRB in June 2018 due to concerns related to the use of scents and sample contamination due to previous exposure to the scents and previous experience of the proposed sample having the doctoral student as an instructor, thus, there is no significant quantitative or qualitative data to report for the project; however, there is a specific research methodology which would be beneficial for the Hunt School of Nursing to use to evaluate the effectiveness of aromatherapy. This study would use a pretest-posttest design, using both quantitative and qualitative data, to determine stress levels of undergraduate students and the effectiveness of aromatherapy as an intervention for test anxiety. Participants would be asked to complete the Westside Test Anxiety Scale (Appendix A-2) and an Aromatherapy Follow-Up Questionnaire (Appendix A-3) created by the doctoral student. The Westside Test Anxiety Scale consists of 10 items. Questions are answered on a 5-point Likert scale with answers ranging from *extremely to always true* to *not at all or never true*. The total score is added up and divided by 10. The resulting score is the Test Anxiety Score. Scores are interpreted as follows:

- 1.0—1.9 Comfortably low test anxiety
- 2.0—2.5 Normal or average test anxiety
- 2.5—2.9 High normal test anxiety
- 3.0—3.4 Moderately high (some items rated 4=high)
- 3.5—3.9 High test anxiety (half or more of the items rated 4=high)
- 4.0—5.0 Extremely high anxiety (items rated 4=high and 5=extreme)

Reliability and validity information was not available for this tool, though the author reports it has “high face validity” (Driscoll, n.d., p. 2). The original planned study consisted of a convenience sample of 13 Accelerated Bachelor of Science in Nursing (ABSN) students enrolled in NUR 461, an undergraduate nursing course, at Gardner-Webb University. These students were in their final semester and would have graduated in August 2018; however, the study was not completed due to previously stated IRB concerns. Thus, a modified study could be used by the organization to determine the following: (a) Do undergraduate nursing students experience test anxiety? and (b) Is aromatherapy an appropriate intervention for the management of test anxiety for undergraduate nursing students?

The study would consist of three parts:

- Part 1: Students enrolled in undergraduate nursing courses would be invited to participate in the study. The Hunt School of Nursing Undergraduate Team could decide which course to complete the research (i.e., one first-year course and one second-year course) to include as many participants as possible. At the end of a lecture, the faculty researcher would explain the purpose of the research study and provide Informed Consent. Students willing to participate would be asked to complete the Westside Text Anxiety Scale. The faculty researcher would



distribute the scale and place an empty envelope at the front of the classroom for students to return completed or blank surveys. The faculty researcher and course professor would leave the room during this process. Aromatherapy lotions would be left in the classroom, so students could sample lotions as desired. This session would occur approximately one week prior to the first exam.

- Part 2: On test days, the faculty researcher would place the aromatherapy lotions at the front of the classroom. Students could select and apply their preferred scent as desired. The faculty researcher would not be present and would not know which students choose to apply the aromatherapy lotions.
- Part 3: Following completion of either the last unit exam or final exam, the faculty researcher would distribute the Westside Test Anxiety Scale and an Aromatherapy Follow-Up Questionnaire. The faculty researcher would distribute both documents and place an empty envelope at the front of the classroom for students to return completed or blank surveys. The faculty researcher would leave the room during this process. Following completion of the study, data would be collected, analyzed, and reported.

There are minimum to no risks to subjects in this research study. Mild test anxiety may occur related to eliciting perceptions of student test anxiety levels. Any student who exhibited anxiety or stress related to completion of the survey would be directed to contact the Gardner-Webb Counseling Center at 704-406-4103. Additionally, students with allergies or sensitivities to scents, such as eucalyptus, lavender, or any other sensitivities related to scents would be advised to avoid participation in this study. Students would be warned of the risk of participating if they have allergies or sensitivities to scents. Aromatherapy lotions would be made available to students prior to the first day of testing, so students could test lotions for sensitivities, if desired. Any student who experienced an allergic reaction should wash the lotion off immediately and contact their healthcare provider. This research would not involve deception nor incentives of any kind. Participation in this study would be voluntary. Completion of the survey would also be anonymous, and participants who chose not to participate could submit a blank survey. Students would be informed that survey responses would have no effect on their course grade and choosing not to participate would have no effect on their course grade. In order to protect research subjects, students could be surveyed by an instructor other than the assigned course professor. Surveys would be reviewed at the end of each semester by the organizational administration or course professors and then destroyed. The undergraduate team and Hunt School of Nursing as a whole could then decide to adopt the program or modify it as necessary. This program would have future potential for adoption by the Hunt School of Nursing Graduate Team and Gardner-Webb University as a whole.

## 9 Risks, Constraints, Assumptions

### 9.1 Risks

There are certain risks that can be associated with organizational change or researching improvement measures. These risks must be identified, a plan must be developed for both mitigation and contingency, and the impact and the likelihood of occurrence must be considered. Table 6 illustrates a risk analysis associated with the project.

Table 6

#### *Risk Analysis*

<b>Risk Description</b>	<b>Mitigation Plan</b>	<b>Contingency Plan</b>	<b>Impact</b>	<b>Likelihood of Occurrence</b>
1) Mild Test Anxiety	<ul style="list-style-type: none"> <li>Not applicable (students may either have or not have test anxiety)</li> </ul>	<ul style="list-style-type: none"> <li>Any student that exhibited anxiety or stress related to completion of the survey would be directed to contact the Gardner-Webb Counseling Center</li> <li>Non-symptom associated test anxiety would not be shared or reported</li> </ul>	<ul style="list-style-type: none"> <li>Students with high levels of test anxiety could be identified and treated early to help facilitate their success in undergraduate nursing education</li> </ul>	High
2) Failure to Approve the Study	<ul style="list-style-type: none"> <li>Consider any anticipated risks for human subjects</li> <li>Work with Site Advisor and Consultancy Coach to anticipate obstacles</li> </ul>	<ul style="list-style-type: none"> <li>Modify the study for the organization to consider personal implementation</li> </ul>	<ul style="list-style-type: none"> <li>Students would not have the opportunity to participate in aromatherapy sessions to assist with managing test anxiety</li> </ul>	Medium

3) Local Skin Reaction or Systemic Reaction	<ul style="list-style-type: none"> <li>Assess student allergies prior to testing scents</li> <li>Warn students of potential skin reaction</li> <li>Implement and follow the Hunt School of Nursing Aromatherapy Policy</li> </ul>	<ul style="list-style-type: none"> <li>Ensure viability and safety of the student(s) impacted</li> <li>Refer any student(s) impacted to their primary care provider or in emergency cases, contact Emergency Medical Services (EMS) immediately</li> </ul>	<ul style="list-style-type: none"> <li>Depending on the severity of the reaction, a student may need to wash the affected area, see their primary care physician, or a faculty member may need to contact EMS</li> </ul>	Medium
4) Negative Perception of Aromatherapy by Faculty	<ul style="list-style-type: none"> <li>Assess faculty perceptions of aromatherapy in an open-group setting</li> </ul>	<ul style="list-style-type: none"> <li>Complete individual and group brainstorming sessions to investigate different methods for managing test anxiety</li> </ul>	<ul style="list-style-type: none"> <li>If faculty are opposed to trialing aromatherapy, then success may decrease and students may not receive anticipated benefits of managing test anxiety</li> </ul>	Low
5) Negative Perception of Aromatherapy by Students	<ul style="list-style-type: none"> <li>Assess student perceptions of aromatherapy in an anonymous survey format</li> </ul>	<ul style="list-style-type: none"> <li>Complete individual and group brainstorming sessions to investigate different methods for managing test anxiety</li> </ul>	<ul style="list-style-type: none"> <li>If students are opposed to using aromatherapy, then success may decrease and students may not receive anticipated benefits of managing test anxiety</li> </ul>	Low

## 9.2 Constraints

Some constraints under which the project operated included the following:

- 1) Approval: The project was approved by the Hunt School of Nursing Dean; however, further approval for data metrics would be necessary from the IRB.
- 2) Faculty: Prior to implementation of an organizational change, perceptions and opinions should be explored and considered. Also, the health and safety of faculty should be considered (i.e., sensitivities to scents).
- 3) Funding: There is no current budget or funding for this project. Initiation would be a personal out-of-pocket cost for the doctoral student.
- 4) Students: Prior to implementation of an organizational change, as stakeholders, perceptions and opinions of students should be explored and considered. Also, the health and safety of students should be considered (i.e., sensitivities to scents).
- 5) Time: Time constraints related to the project application and approval were necessary. The project application required documents were necessary to submit to the Dean by April 2018. The IRB documents were necessary to submit to the Hunt School of Nursing committee by May 2018.

## 9.3 Assumptions

During the research process, five assumptions were identified that are necessary to consider in terms of success or failure of the project. Table 7 illustrates these assumptions as well as documentation and support of the assumptions.

Table 7

### *Documented Assumptions*

Assumptions	Documentation and Support
1) Adoption by the Hunt School of Nursing and Gardner-Webb University	<ul style="list-style-type: none"> <li>• Adoption may be supported by organizational research and previous findings from the literature</li> <li>• According to Floyd (2011), “The mental health of university students is a topic of increasing concern throughout the world...” (p. 29)</li> <li>• Further, “The extent of the effect that depression, anxiety, and stress have on grade point average (GPA) is unclear” (Floyd, 2011, p. 29)</li> <li>• Thus, the potential issue of undergraduate and/or graduate student test anxiety may be a phenomenon experienced across the university and should be addressed if applicable</li> </ul>
2) Faculty Involvement	<ul style="list-style-type: none"> <li>• Some faculty have been using various forms of aromatherapy (e.g. diffusion, essential oils, lotion application, etc.) on an informal basis</li> </ul>

	<ul style="list-style-type: none"> <li>• Consistency across the nursing programs and faculty usage would be ideal because “Test anxiety usually emerges from the highly structured processes of assessment and testing of student performance across the entire nursing school curriculum” (Gibson, 2014, p. 267)</li> <li>• In addition, “When test anxiety is present, learning and performance is challenged, and more interventions should be developed to decrease this problem” (Gibson, 2014, p. 275)</li> <li>• If test anxiety is not properly managed, nursing students may ultimately be unsuccessful passing the National Council Licensure Examination for Registered Nurses (NCLEX-RN®)</li> <li>• Decreased pass rates for the NCLEX-RN® could affect accreditation for the undergraduate nursing programs</li> </ul>
3) Rejection by the Faculty	<ul style="list-style-type: none"> <li>• Faculty resistance may be related to personal sensitivities to scents, personal perceptions of aromatherapy, or resistance to change</li> <li>• To assist with faculty resistance, the doctoral student could share a study by Floyd (2011), which notes “It is of utmost importance to identify the emotional challenges students face today in higher education” (p. 29). Further, “One of these challenges involves recognizing students with stressors that may occur during enrollment in a nursing program at a university” (Floyd, 2011, p. 29)</li> </ul>
4) Rejection of the Study	<ul style="list-style-type: none"> <li>• Proper approval of a research study is necessary to protect the research participants, researcher(s), and organization</li> <li>• The doctoral student anticipated that rejection may be a possibility due to the nature of the study and exposure to various scents (i.e. allergies or sensitivities)</li> <li>• The project was later rejected by the IRB in June 2018 due to concerns related to the use of scents and sample contamination due to previous exposure to the scents and previous experience of the proposed sample having the doctoral student as an instructor.</li> <li>• The project in its entirety may be rejected for implementation by the Hunt School of Nursing administration due to limitations related to cost and faculty/student allergies (Quinn &amp; Peters, 2017)</li> </ul>
5) Student(s) Inability to Participate	<ul style="list-style-type: none"> <li>• Due to the wide range of scents and allergies to scents, student participation may be affected</li> </ul>

	<ul style="list-style-type: none"><li>• Any student(s) who is/are unable to participate would affect the ability for the entire class to use aromatherapy as an intervention. This may lead to academic concerns or potential appeals, which may be a hindrance to the adoption and implementation of an aromatherapy program by the Hunt School of Nursing or Gardner-Webb University as a whole</li><li>• There are several types of essential oils that can be used for studies to measure the effect of aromatherapy</li><li>• In a study by Johnson (2014), the researcher used lemon essential oil due to safety and availability to be used for adults and children</li></ul>
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## 10 Financial Plan

There was no actual budget provided for this project, but rather a projection of costs based on implementation. Table 8 illustrates an itemized list of the initial projection of costs.

Table 8

### *Initial Projection of Costs*

<b>Item</b>	<b>Cost (Per Unit)</b>	<b>Total Cost</b>
Bath & Body Works Comfort Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Bath & Body Works Energy Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Bath & Body Works Focus Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Bath & Body Works Happiness Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Bath & Body Works Sleep Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Bath & Body Works Stress Relief Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Sterilite 19618606 Clip Box Regular Clip Box	\$6.88 (need four boxes: one for NOEL Center and three for testing carts)	\$27.52 (plus tax; Amazon Prime shipping for free)
COVIDIEN 5750 Curity Alcohol Preps Wipes, Sterile, 2-Ply, Medium (Pack of 200)	\$4.57 (need four boxes: one for NOEL Center and three for testing carts)	\$18.28 (plus tax; Amazon Prime shipping for free)
<b>TOTAL PROJECTED COST: \$400 (\$369.80 and applicable taxes and shipping)</b>		

Following some recommendations from the IRB, the doctoral student found two scented lotions that would be more appropriate to use. Using less aromatherapy products significantly reduced costs for implementation. The revised projection of costs for implementation of this projection is listed in Table 9.

Table 9

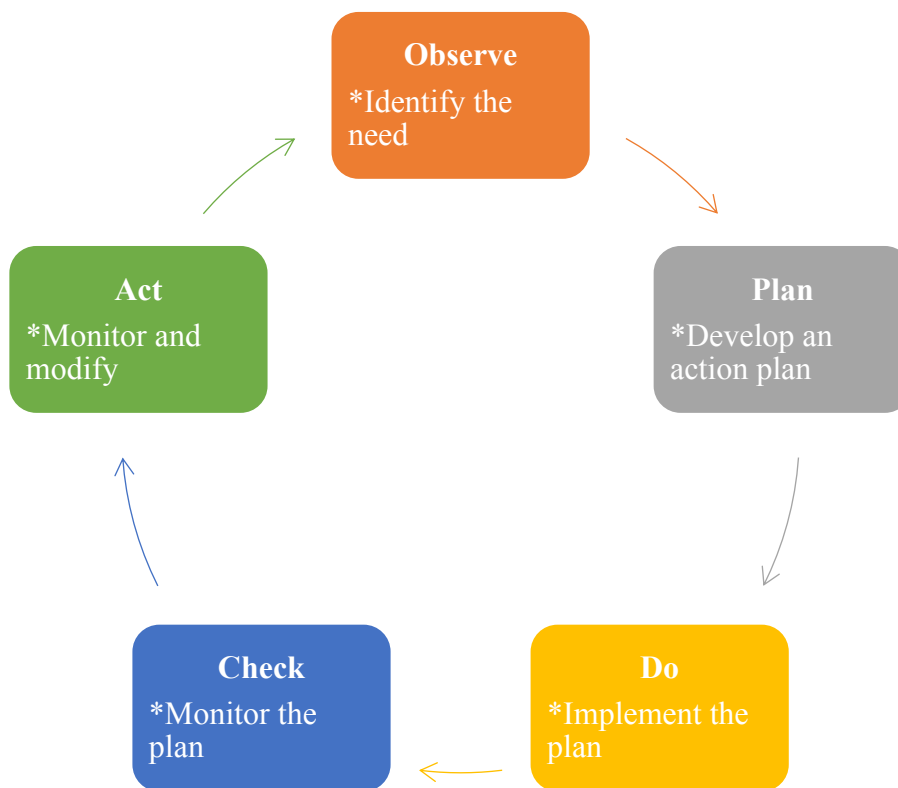
*Revised Projection of Costs*

<b>Item</b>	<b>Cost (Per Unit)</b>	<b>Total Cost</b>
Bath & Body Works Eucalyptus Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Bath & Body Works Lavender Aromatherapy Lotion (available in store or online)	\$13.50 (need four units: one for NOEL Center and three for testing carts)	\$54.00 (plus tax, shipping, and handling)
Sterilite 19618606 Clip Box Regular Clip Box	\$6.88 (need four boxes: one for NOEL Center and three for testing carts)	\$27.52 (plus tax; Amazon Prime shipping for free)
COVIDIEN 5750 Curity Alcohol Preps Wipes, Sterile, 2-Ply, Medium (Pack of 200)	\$4.57 (need four boxes: one for NOEL Center and three for testing carts)	\$18.28 (plus tax; Amazon Prime shipping for free)
<b>TOTAL PROJECTED COST: \$175 (\$153.80 and applicable taxes and shipping)</b>		



## 11 Quality Assurance Plan

“Plan-do-check-act (PDCA) is a four step cycle that allows you to implement change, solve problems, and continuously improve processes. Its cyclical nature allows it to be utilized in a continuous manner for ongoing improvement” (Agency for Healthcare Research and Quality [AHRQ], 2018, para. 1). The Plan Phase consists of planning the change that is to take place or the process improvement (AHRQ, 2018). Next, the Do Phase involves a trial of the planned change (AHRQ, 2018). Then, the Check Phase involves collecting data related to the change and assessing the plan’s success (AHRQ, 2018). Last, the Act Phase consists of implementing the change within a larger sample, monitor, repeat, and change as needed (AHRQ, 2018). In the modified version of Deming’s PDCA model, the Observe Phase is added to the model, which involves identifying the need. Figure 4 illustrates the modified Deming Cycle of quality assurance, which will be used as the quality assurance framework of the “Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Students” project.



*Figure 4.* OPDCA Cycle. This figure illustrates the modified Deming Cycle of quality assurance.

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**Observe**

Observation led to the idea for the “Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Students” project. Over the summer 2017 semester, several nursing instructors allowed nursing students within the Accelerated Bachelor of Science in Nursing (ABSN) program to use their personal “Stress Relief” lotion prior to exams. This was a small cohort of 16 students who were under time constraints related to a short semester and heavy course load of approximately 16 credit hours. The instructors felt this intervention would be effective for reducing test anxiety. The intent of the instructors and the need of the students led to the development of the idea and proposal of this project.

**Plan**

Planning for the change that is to take place related to the project “Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Students” was extensive. A comprehensive literature review yielded several implications for using aromatherapy products to assist with alleviating nursing student test anxiety. This research resulted in the development of a proposal, which was reviewed and approved by both the Hunt School of Nursing Dean and the Prelicensure Program Chair. This proposal was also shared with the Consultancy Coach for review. The success of the planning phase will be met with the following criteria: approval of the project proposal and receipt of Institutional Review Board (IRB) approval. In June 2018, the project proposal was rejected by the IRB due to health risks associated with the use of various scents, thus this project would need to be implemented on an informal basis according to the policy draft and would not be eligible for publication.

**Do**

The Do Phase involves a trial of the planned change (AHRQ, 2018) that is developed within the consultancy plan. The initial plan involved re-trialing aromatherapy sessions during the summer 2018 semester. The senior class of ABSN students (n=14) would be screened using the Westside Test Anxiety Scale and would have had the opportunity to apply an aromatherapy lotion of their choice prior to taking each exam, whether it be a paper exam or a computerized exam. At the end of the semester, students would have been surveyed regarding the effectiveness of the intervention and if they recommend aromatherapy as an intervention for the alleviation of test anxiety. Due to rejection from the IRB, the study did not take place.

**Check**

Checking will be the most simplistic portion of quality assurance. During this phase, the faculty can collect data, analyze data, and evaluate and report the conclusions drawn from the data. Students will be given confidential surveys to complete that will provide data to evaluate if the aromatherapy interventions were effective. Certainly, there will be future

implications yielded from the research that may result in modification of the previous plan.

### **Act**

Several actions will be taken to measure the effectiveness of the project goals. Following completion of the study, faculty will be able to discern whether the intervention was effective or not. Then, research findings will assist with continually monitoring the effectiveness of the “Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Students” project and identifying modifications that need to be made as necessary.

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## **Appendix A: Hunt School of Nursing Aromatherapy Policy**

**TITLE:** Hunt School of Nursing Aromatherapy Policy

**PURPOSE:** To provide a standard for availability and usage of aromatherapy-based products for the intent of alleviating test anxiety.

**ORIGINATION:** 5/18

**REVISION:**

**REVIEW:**

**POLICY:** Exams are administered in various classes in both the undergraduate and graduate programs of the Hunt School of Nursing. Research has shown that “Test-taking anxiety effects the students’ exam scores negatively” (Cürçani, Küçüköğlü, & Tan, 2015, p. 52). The “Hunt School of Nursing Aromatherapy Policy” exists to provide students with the opportunity to use aromatherapy-based products for the intent of alleviating test anxiety.

### Guidelines for All Programs in the School of Nursing:

1. All exams will follow the Policy of Academic Honesty located in Gardner-Webb University’s Academic Catalog.
2. Course professors will assess each class at the beginning of each semester for allergies related to: eucalyptus, lavender, or any other sensitivities related to scents.
3. All course professors reserve the right to prohibit aromatherapy administration due to personal allergies or student allergies.
4. Aromatherapy will be offered 10 minutes before the beginning of the testing session. Students who are late for the aromatherapy session will not be allowed to participate.
5. Students are not allowed to bring in any outside aromatherapy-based products. Students are allowed to either use or not use what is offered by the professor.
6. Each testing cart will contain two bottles of aromatherapy-based lotion (one eucalyptus and one lavender). Following application, course professors will cleanse each bottle with an approved disposable sanitation wipe for infection control purposes.
7. A supply of lotion products will also be sent to the NOEL Center for Disabilities for students who have accommodations through the center to use on test days. When an exam is returned from NOEL, the lotion supply will be returned as well.
8. To maintain consistency with testing procedures, course professors will alert the department secretary when an aromatherapy-based product is in low quantity for re-stocking purposes.

### References

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### Appendix B: Westside Test Anxiety Scale

Rate how true each of the following is of you, from extremely or always true, to not at all or never true. Use the following 5 point scale:

5	4	3	2	1
Extremely or always true	Highly or usually true	Moderately or sometimes true	Slightly or seldom true	Not at all or never true

- \_\_\_ 1) The closer I am to a major exam, the harder it is for me to concentrate on the material.
- \_\_\_ 2) When I study, I worry that I will not remember the material on the exam.
- \_\_\_ 3) During important exams, I think that I am doing awful or that I may fail.
- \_\_\_ 4) I lose focus on important exams, and I cannot remember material that I knew before the exam.
- \_\_\_ 5) I finally remember the answer to exam questions after the exam is already over.
- \_\_\_ 6) I worry so much before a major exam that I am too worn out to do my best on the exam.
- \_\_\_ 7) I feel out of sorts or not really myself when I take important exams.
- \_\_\_ 8) I find that my mind sometimes wanders when I am taking important exams.
- \_\_\_ 9) After an exam, I worry about whether I did well enough.
- \_\_\_ 10) I struggle with writing assignments, or avoid them as long as I can. I feel that whatever I do will not be good enough.

\_\_\_\_\_ Sum of the 10 questions. Divide the sum by 10. This is your Test Anxiety score.

#### What does your test anxiety score mean?

- 1.0—1.9 Comfortably low test anxiety
- 2.0—2.5 Normal or average test anxiety
- 2.5—2.9 High normal test anxiety
- 3.0—3.4 Moderately high (some items rated 4=high)
- 3.5—3.9 High test anxiety (half or more of the items rated 4=high)
- 4.0—5.0 Extremely high anxiety (items rated 4=high and 5=extreme)

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**Appendix C: Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Nursing Students Follow-Up Questions**



**GARDNER-WEBB  
UNIVERSITY**

**Investigating Aromatherapy as a Test Anxiety Intervention for Undergraduate Nursing Students Follow-Up Questions**

1. Did you find the aromatherapy lotion application intervention effective prior to taking your exams? Please explain why or why not.
  
  
  
  
  
  
  
  
  
  
2. Did you miss any aromatherapy lotion application sessions? If not, please answer "Not Applicable" (N/A). If so, did it affect your test performance?
  
  
  
  
  
  
  
  
  
  
3. From the choices provided, which lotion do you feel was most beneficial?
  - a. Eucalyptus
  - b. Lavender

\_\_\_\_\_ (Please write the letter (a-b) for your choice on the provided line).
  
  
  
  
  
  
  
  
  
  
4. Do you have any other recommendations to assist with alleviating test anxiety?