BARRIERS TO SYSTEMATIC TRAINING   
TO REDUCE HUMAN ERROR IN HEALTHCARE INSTITUTIONS:  
 A GROUNDED THEORY INQUIRY

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A Research Proposal  
 Submitted in Partial Fulfillment of the Requirements for the   
Degree of Doctor of Philosophy

Omega Graduate School

Graduation Date

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ABSTRACT

The abstract appears at the front of the report, but it is written after all else has been completed. An abstract is a short unbiased summary (no more than 350 words) of the main elements of the completed research, so it is never part of a proposal. An abstract includes: introduction to the subject, description of what was done, results, and the meaning of it all. It captures the content of Chapters 3, 4, and 5 in extremely condensed form. This may be the most difficult part of the dissertation to write because it must clearly describe the whole in a few words.

Decide what will be of most value to your reader. If it were a sports story, you’d tell who won (the result), what sport it was (procedure), who played (context), and why it was important (significance). Same thing here. Make sure that it is clear to someone who knows nothing about the topic of your research. It is brief—just an overview to show that it was a carefully executed study. (A report of an NFL game doesn’t recite the rule book.) State each hypothesis and whether it was supported or not supported. Brag objectively about the significance if you wish. You may use energetic language even though it is written in formal style (APA 6th, 2.04, p. 25). The page is counted, but no page number is shown.

DEDICATION

To Robert Cox,

W. Bosseau Murray and   
Richard Kyle,  
positive deviants all

.

ACKNOWLEDGEMENTS [Optional]

Acknowledgments are short and vivid like thank you’s at the Academy Awards but more sincere. Mention only the most meaningful helpers. Place on its own page, centered three inches from the top of the page.

EPIGRAPH

If we trained pilots  
 the way we train surgeons,   
there would not be a plane in the sky.

Klaus Lucke  
Surgeon

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CHAPTER 1: INTRODUCTION

**Problem Statement**

In the healthcare institutions of United States, preventable human error kills people (Kavanagh et al., 2017; Kohn et al., 2000). The national death toll has been estimated to exceed several hundred patients each day; this is equivalent to an airliner crashing every day of the year. Many more survive but are mangled or harmed in the process. The estimated financial cost to the nation is estimated to range over 30 billion dollars each year.

Preventable human error has been demonstrably reduced in the aviation and nuclear power professions by means of systematic training; the investment of resources in systematic training in these professions has a clear and measurable return on investment (ROI) (Crosby, 1980). Systematic training is evident in the form of documented task analysis, defined task conditions and standards, lesson plans, and formative and summative evaluations. However, in the healthcare field where preventable human error is known to cause unacceptable morbidity and mortality, training is rarely systematic (Henriksen & Dayton, 2006). Financial resources that could be invested in incident prevention via systematic training are instead reserved for consequence management: lawsuits and out-of-court settlements.

Purpose

The purpose of this research is to explore and describe organizational and cultural barriers that may be preventing the use of systematic training in healthcare institutions to reduce preventable error. Understanding organizational and cultural barriers may help policymakers draft and adopt regulatory guidance that materially reduces preventable error, and consequently, its morbidity and mortality and financial costs.

**Background of the Problem**

The healthcare professions (e.g., doctors, nurses, scrub techs, emergency medical technicians) have struggled diligently to mitigate human error since the time of Hippocrates in the third century. The Hippocratic oath has been updated, its authorship challenged, and its relevance questioned, but numerous medical schools still use it to solemnize their graduation ceremonies (Hulkower, 2016; Markel, 2004). The Hippocratic oath captures the essential ethics of preventing human error in healthcare (Miles, 2003); accordingly, it served as the guide for developing its modern successor, the *Declaration of Geneva* (Spiegel et al., 2019). Debates about the ethics of modern issues continue to invoke the *Oath* (Goligher et al., 2019), and recent advances in medical technology have been accompanied by concerted efforts to apply the principles in the *Oath* (Woods et al., 2019).

Hospitals in the United States were first inspected using a rubric of standards in 1918; in 1951, several organizations joined to create an independent, not-for-profit organization to provide voluntary accreditation of hospitals. This organization, the Joint Commission on Accreditation of Hospitals (JCAH), became functionally tied to the federal government with the passage of the Medicare Act in 1965, in that JCAH-accredited hospitals were deemed compliant for the purposes of Medicare payments (Franko, 2002). Today, this organization is known simply as The Joint Commission. Although the pressure to achieve and maintain accreditation might be seen as a strong incentive, inspections do not guarantee quality (Anderson et al., 1994); rather, quality must be built in from the beginning, even in healthcare (Baum, 2019).

A major factor in addressing preventable human error is the right of the injured party to file suit for malpractice in the courts (Schouten, 2017). Such rights are regulated more by state laws than by Federal laws. While this has proven a financial incentive to reduce human error, the primary result has been the expansion of the malpractice insurance industry (Wallace, 2017), with damages increasing over time, driving increasing premiums, and corresponding movements to cap damages (Gallegos, 2019). The constitutionality of statutory caps has become a hot debate (Hubbard, 2020). The increasing incidence of malpractice claims has also incentivized clinicians to prescribe unnecessary tests and treatments, a costly phenomenon known as *defensive medicine* (Bishop & Pesko, 2015; Delice et al., 2019; Saks & Landsman, 2020). Together, malpractice insurance and defensive medicine phenomena are causing healthcare costs to rise (Castro et al., 2019).

Overall, this appears to be a classic challenge in quality, similar to that faced in many industries and professional fields of endeavor. Simply put, this is a question of how to build in quality upfront, where the cost of quality is usually relatively small compared to the cost of quality failure (Crosby, 1980, 1996). Institutions that have invested time and resources to build quality upfront have been labeled *High Reliability Organizations* (HRO) (Roberts, 1990), an honorific that has caught the attention of healthcare institutions (Beauvais et al., 2017; Chassin & Loeb, 2013). Investments in systematic training are considered essential to obtain highly reliable performance in healthcare (Baker et al., 2006; Wilson et al., 2005). While some healthcare institutions have formally adopted a strategy calling for high-reliability principles, the concrete implementation of such strategies has proven difficult; more specifically, the allocation of resources for training has been identified as an organizational obstacle (Kapec, 2017).

The elements described above serve to form an *a priori* model to frame the initial research approach (*Figure 1*). Un-labelled shapes represent yet-to-be-discovered factors. As the research progresses and data is collected and analyzed, this model will be updated via memo-ing. Influence and causality relationships among the elements will be theorized.

Figure 1. Initial framework for the research.

Setting of this Research

This research will be conducted in healthcare institutions, both public and private, and in state health organizations in the United States. The professional occupations requiring clinical skills training include a variety of doctors (e.g., surgeons, anesthesiologists, ophthalmologists), a variety of nurses (e.g., emergency, intensive care, labor and delivery), and a variety of medical technicians and paramedics. For the purposes of this research, these professions will be referred to collectively as *clinicians*. While some clinical skills are infrequently practiced and highly specialized (e.g., prenatal heart surgery) and therefore practiced by a few, other skills such as intubation and ultrasound are widely practiced across occupational categories. Clinicians of all types are the target audience for any training in reducing human error.

The issues which will form the focus of this research, however, are rarely within the scope of clinicians. The few clinicians that rise to institutional management positions such as Head of Surgery or Head of Nursing may begin to have the management perspective broad enough to encompass training strategy, policy and resource investments in either prevention of human error or the management of its consequences, but until these practitioners are promoted to this level, they may not be able to observe, much less influence, the institutional issues in view.

Accordingly, this research will focus on senior managers and executives whose perspective within their institution might enable them to comprehend both the impact of preventable human error and the practical investment in training systematically to reduce that error. Some of these will be clinicians who have been promoted to Chief of Surgery or Chief of Nursing, as noted earlier, but many may not be clinicians of any kind. As a consequence of their position and experience, these senior-level managers and executives might have either observed or experienced the hindering phenomena broadly hypothesized in this proposal as falling in one of two categories: organizational barriers and cultural barriers. If so, these managers and executives should be able to identify and describe organizational and cultural issues that might be preventing institutional commitment to systematic training.

Thesis Statement

There may be organizational and cultural barriers to implementing systematic training approaches that can reduce preventable human error in healthcare institutions.

Research Questions

It is not known what organizational and cultural barriers in healthcare institutions may be preventing the use of systematic training to reduce preventable error.

1. What organizational barriers might be preventing the implementation of systematic training to reduce preventable human error in healthcare institutions?
   1. What written policies and procedures are in place that might affect training to reduce human error?
   2. What financial management issues exist that actively hinder logical assessment of investments in training with error consequence management?
   3. What career progression issues hinder management from focusing on systematic training?
   4. How does the threat of litigation affect an institution’s approach to managing preventable human error?
   5. …
2. What cultural barriers might be preventing the implementation of systematic training from reducing preventable human error in healthcare institutions?
   1. What unwritten philosophies and policies hinder consideration of systematic training to prevent human error?
   2. What professional communication issues hinder consideration of systematic training to prevent human error?
   3. What attitudes hinder consideration of systematic training to prevent human error?
   4. What team-building issues hinder the implementation of systematic training to prevent human error?
   5. What professional conflict resolution issues hinder the implementation of systematic training to prevent human error?
   6. …

Research Approach

This research will be conducted as a grounded theory inquiry investigating psychosocial phenomena (Creswell, 2014; Creswell & Poth, 2018); this approach is also called a “phenomenology of practice” (van Manen, 2016). A more detailed description of this method appears in Chapter 3.

Anticipated Outcomes

The anticipated outcomes include the identification and description of organizational and cultural barriers to implementing systematic training, based on themes that emerge from interviews, and a theory of organizational behavior that clarifies the barriers to implementing systematic training to reduce human error in healthcare institutions.

Research Assumptions

This research assumes that the central thesis of the IOM report (*To Err is Human*) is sound: significant morbidity, mortality, and financial cost in clinical practice are partly the result of preventable human error. It is further assumed that human error in clinical practice is directly related to the design and implementation of clinical training. In other words, it is assumed that the healthcare profession shares with the aviation and nuclear power professions the specifically causal relationship between training and human error. More specifically, it is assumed that the absence of a systematic approach to designing and implementing a clinical training system is a causal factor in the frequency of preventable human error in clinical practice.

This research will assume that organizational and cultural barriers are properly understood as psychosocial phenomena. It is assumed that each site (a single hospital or clinic) will probably be composed of several healthcare institutions, both public and private, that collaborate in a professional symbiotic relationship. It is assumed that some of these collaborative institutions are malpractice insurance carriers.

It is assumed that each institution is comprised of several professional cultures. The culture of principal interest for this research is the culture that pervades upper-level management, where (a) resource allocations are decided and (b) where the cost and consequences of human error in the institution are managed. It is further assumed that mid- to upper-level managers and executives in healthcare institutions will have sufficient perspective and willingness to provide insight into what issues are preventing the implementation of systematic training from preventing human error. Finally, it is assumed that these managers may need some orientation and education about the differences between systematic training and how clinicians are currently trained.

This research assumes that the research questions are too broad for quantitative research and fall within the domain of qualitative research. It is assumed that a theory can be constructed about organizational and cultural phenomena relevant to the issues of preventable human error. As with most qualitative research designs, it is assumed that the researcher can function effectively as the instrument of research. It is assumed that the researcher’s inherent bias, a driving force in pursuing and discovering the issues at stake, can be restrained from tainting the outcomes by personal discipline and diligence. While the assumptions listed above frame the researcher’s bias, over the course of the research, a rhythm of reflexive review will be employed to periodically examine the validity of the assumptions in light of conversation with participants and research mentors.

Significance of the Research

Understanding the organizational and cultural barriers to systematic training should allow suggested courses of action that may help policy makers draft and adopt regulatory guidance for healthcare institutions that materially reduce preventable error and the morbidity, mortality and financial costs it is known to cause.

Even a partial implementation of systematic training to reduce preventable human error in clinical skills appears to have the potential to benefit both the patient population and the clinician population in significant ways and to significant degrees. Among patients, these benefits may take the form of reduced mortality and morbidity, and reduced time away from work and family (Adler et al., 2018; Kavanagh et al., 2017). Among clinicians, these benefits may take the form of reduced time-to-train, as well as reduced emotional stress and lower malpractice premiums.

From the institution’s perspective, a significant reduction in the cost-per-trainee may derive from reducing the need for senior staff manhours and reducing the time consumed in the operating room to train the skill to the required proficiency standard. From the broader societal perspective, that portion of the cost of healthcare driven solely by the threat of malpractice litigation might be reduced because some of the resources currently reserved for consequence management might now be invested in systematic prevention of error and demonstrably improving clinician performance.

CHAPTER 2: REVIEW OF LITERATURE

This chapter reviews the literature that may be relevant to the issues tentatively expected to comprise this phenomenon.

Purpose

The purpose of this research proposal literature review is to establish a broad, *a priori* understanding of the field of inquiry sufficient for beginning to collect data from participants; subsequent literature reviews are planned to iteratively and recursively respond to the data collected over the course of the inquiry (Tracy, 2019). Therefore, in keeping with current practice in grounded theory research design (Akcam et al., 2019; Birks et al., 2019; Chun Tie et al., 2019; Corbin, 2016; Merriam & Tisdell, 2015), this initial literature review is primarily composed of seminal, frequently-cited works that, taken together, scope out the field of inquiry in preparation for initiating the data collection and the subsequent iterative analysis cycles.

This kind of preparatory literature review might best be illustrated by envisioning a large tent thrown up over the site of an archeological dig, in that a relatively small number of centrally located poles—perhaps a dozen—suffice to establish the extent of the intended research area. In this analogy, the seminal works function like these central poles; they scope out the basic background knowledge that will probably be required to understand the field of interest. Once the interview process begins to expose artifacts of interest, other research-enabling structures—in the form of more focused literature reviews—will be added iteratively to ensure the journey of excavation and interpretation proceeds to a comprehensive conclusion.

For the initial literature review to support the proposal, the researcher investigated the following major areas: the current use of the terms “preventable human error”, “patient safety” and “systematic training”; the current state of practice with regard to training to prevent human error in healthcare institutions, and more specifically research into that practice; the current use of the terms “organizational barriers”, “organizational culture” and “cultural barriers” as they pertain to institutions.

Literature Review: Historical Background

At the beginning of the 21st century, the U. S. Government published a landmark document, “*To Err is Human: Building A Safer Health System*” (Kohn et al., 2000). The authors estimated the annual cost of preventable human error in terms of lives lost (mortality) and financial impact:

At least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year as a result of medical errors that could have been prevented, according to estimates from two major studies…Beyond their cost in human lives, preventable medical errors exact other significant tolls. They have been estimated to result in total costs…of between $17 billion and $29 billion per year in hospitals nationwide.

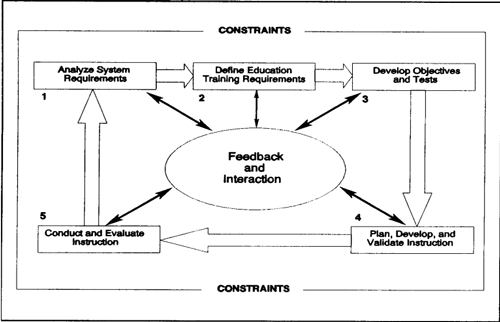
The Institute of Medicine followed up with two more reports examining human error in health care. For perspective, it is important to note that the lower morbidity estimate of 44,000 equates to an airliner full of people crashing and killing all aboard every other day, all year long; the higher estimate equates to an airliner crashing every day of the year.

Aviation and Nuclear Power Professions Employ the Systems Approach to Training to Manage Risk Induced by Human Error

Due to the catastrophic cost of human error in aviation and nuclear power generation, these professions rigorously apply a systematic approach to designing, implementing, and evaluating the training of practitioners. This approach is more precisely known as the Systems Approach to Training (SAT).

The phrase “systems approach to training” dates as far back as 1965, when it appeared as the title of an article written by G. S. Odiorne and published in the *Training Director’s Journal* (19(10), 11-19). The previous year the US Air Force had published a landmark document, *Determining Training Requirements* (Air Training Command, 1964) and in 1965 this military service developed a five-step model (Figure 1) for developing training systems (Olsen & Bass, 1982). The US Army and Navy followed suit, as all the military services faced a similar challenge: produce high-performance trainees in minimum time and at minimum cost. Evidence of application of the systematic approach consists of artifacts: e.g., task lists with specified conditions and training standards, training device specifications, and lesson plans. Today, for nearly all military career fields where the quality of task performance is critical, this systematic approach is clearly evident with the notable exception of military doctors.

Figure 3. The Air Force Five-Step Model, 1965.



Commercial aviation is no different. Over the past several decades, the Federal Aviation Administration has conducted its Advanced Qualification Program (AQP) originally designed to address a surge in preventable errors in the late 1980s. The AQP requires those commercial airlines who elect to participate to use the systems approach to training used by the military (*AC 120-54A CHG 1*, 2017), as evidenced by the phrase “detailed job task analysis”:

AQP is a systematic methodology for developing the content of training programs for air carrier crewmembers and dispatchers. It replaces programmed hours with proficiency-based training and evaluation derived from a detailed job task analysis that includes Crew Resource Management (CRM). AQP incorporates data-driven quality control processes for validating and maintaining the effectiveness of curriculum content.

In the wake of the 1981 Three Mile Island radiation leak, a non-lethal incident aggravated by human error, the US Congress imposed a statutory requirement for SAT on nine categories of power plant personnel (Para. (b)(ii)(2), 10 CFR §50.120). The statute defined SAT as composed of five key elements (10 CFR §55.4):

Definitions. Systems approach to training means a training program that includes the following five elements:

(1) Systematic analysis of the jobs to be performed.

(2) Learning objectives derived from the analysis which describe desired performance after training.

(3) Training design and implementation based on the learning objectives.

(4) Evaluation of trainee mastery of the objectives during training.

(5) Evaluation and revision of the training based on the performance of trained personnel in the job setting.

Comparison of the Systems Approach with Clinical Skill Training

The U. S. Department of Defense maintains a five-volume handbook to guide the military services in their application of SAT to their training challenges (1997). SAT is more widely known as the “ADDIE model,” an acronym for the five interactive phases (analysis, design, development, implementation, and evaluation). To handle technology upgrades to existing equipment, the military services continue to reapply SAT (under the label “front end analysis”) to training on complex systems (Drzymala, 2015). This approach begins with a detailed analysis of all missions and tasks, both for individuals and for teams (Edling et al., 1972), and determines the conditions under which these tasks must be accomplished and to what performance standards. Training media analysis allocates training content to the most appropriate media. The result is a curriculum-driven training system, consisting of interdependent components: detailed course syllabi, lesson plans, courseware, training device specifications, instructor training syllabi, and evaluation criteria.

In contrast, clinical skills training typically has no syllabus, no lesson plans, and no performance evaluation criteria; it is personality-driven and conducted with few if any of the five elements indicative of a systematic approach (W. B. Murray, personal communication, 2016). While some research articles about “cognitive task analysis” have begun to appear (Dass et al., 2016), scant articles address the psychomotor and affective domains of learning. While patient safety may improve with knowledge, it is not solely a cognitive element: it is predominantly an attitude, and therefore training in patient safety resides in the affective learning domain (Bloom, 1956).

Despite many decades of success in reducing human error in aviation and nuclear power professions, evidence that healthcare institutions are adapting SAT to clinical training challenges is scant. An investigation into a 2017 solicitation for the Advanced Joint Airway Management Simulator revealed that this clinical training program does not have a syllabus (W. B. Murray, personal communication, 2017). This lack of a syllabus in clinical skills training programs appears to be endemic, as does the lack of structured inquiry about performance requirements. For example, one clinical trainer related that task analysis for developing simulations was limited to “very informal inquiry”: “What do you clinicians want to teach, and what learner behaviors do you need to perceive that reveals that they have learned it?” (R. Kyle, personal communication, 2016). It is important to note that this inquiry focused on what the instructors *want* to teach, a subjective starting point. The SAT process starts with a more objective question: What are all the tasks the trainees *must be able to perform*, *under what conditions* and *to what performance standards*? The absence of a detailed syllabus, and the absence of a formal, structured inquiry about task performance requirements, indicate the absence of SAT.

With a few exceptions like laparoscopic surgery (LS), surgical skills are still taught primarily in the operating room, the costliest and most risk-intensive environment, using an unstructured, personality-driven approach. LS training is a notable exception, not because of a systematic analysis of the surgical tasks, but because training LS skills in the operating room took too much time and frequently resulted in damage to the patient, which then had to be corrected by the senior surgeon, incurring further delay and increases in operating room expenses (Spruit et al., 2014).

In summary, it is worth noting that in the medical culture, the persistent training motto is “See one; do one; teach one”, and there is a persistent theme of “Once trained, always proficient” that has been challenged by research on skill loss (Gallagher et al., 2012; Henriksen & Dayton, 2006). This high-risk approach would never be considered appropriate in either the aviation or nuclear power professions.

Patient Safety Leaders Use Aviation in General, and SAT in Particular, as an Illustration

of Successfully Managing Risk Induced by Human Error

Airline companies and military aviation organizations are commonly considered “high reliability organizations” (HRO) by leaders in patient safety. The Agency for Healthcare Quality and Research (AHRQ), under the US Department of Health and Human Services, points to military aviation to illustrate the high reliability mindset. More specifically, in a discussion of the principles of HRO relative to patient safety, members of an independent health care certification organization, the Joint Commission, highlighted the investment in deliberately re-designed training that accomplished an aviation safety culture (Chassin & Loeb, 2013). However, the Joint Commission’s video (*Why High Reliability Matters*) does not include training in their list of means to accomplish HRO performance. Their 2017 annual quality and safety report does not include the terms “training” or “error.”

In contrast, AHRQ leaders have explicitly highlighted SAT as a solution to the challenges of improving patient safety (Henriksen & Dayton, 2006). Their description of systematic approaches to training is of particular interest:

When first introduced, systems approaches to training represented something akin to a paradigm shift in the way knowledge gets taught. An important distinction between education and training emerged. Rather than starting with generalized scholarly knowledge which traditionally gets organized into textbooks and relayed to students under the assumption that knowledge for its own sake is good, the systems approaches start with a system or organizational need, for which training has been identified as a viable solution… (Henriksen & Dayton, 2006).

Likewise, the authors’ contrast between the “see one, do one, teach one” philosophy of the current “apprenticeship model” and the systematic approach is instructive:

The quality and effectiveness of training is enhanced when there is a strong and direct correspondence between instructional content and the actual performance demands of the job. To achieve a high level of effectiveness, training has to be designed; it does not happen in a loose ‘‘see one, do one, teach one’’ fashion. In most systems models for training there is an orderly progression of at least five stages—analysis, design, development, implementation and evaluation—that attempts to ensure the effectiveness of the training… With respect to healthcare delivery, it is recognized that there are many routine clinical tasks…that are subject to excessive variation and lack of standardization that could clearly benefit from a systems approach to training. In addition to excessive variation in the execution of procedures, there also are excessive gaps under the apprenticeship model in the types of cases to which residents and other providers are exposed. System approaches to training can fill these gaps. (Henriksen & Dayton, 2006).

In an interview in 2016, ten years after he co-authored this article, Dr. Henriksen confirmed that scant evidence of application of SAT in the clinical professions was available. Health care professionals continued to note the distinct rigor of aviation training and performance standards as compared with clinical training (Kapur et al., 2015), but the literature shows scant evidence of healthcare institutions applying SAT to their training challenges.

Rationale for Topics

The topics selected for the initial phase of literature review have been gleaned from preliminary literature searches on relevant terminology and the associated semantic fields. This terminology, together with research in organizational development and change and the researcher’s conversation with clinical training staff, have informed the selection of issues that are suspected to contribute to the problem of institutional resistance to adoption of systematic training.

Relevant terminology is deemed to include the following: patient safety; human error; training; systematic training; malpractice; management perspective; organizational change; organizational barriers; organizational culture and leadership; cultural barriers to change; resistance to change; communication barriers; conflict-associated presenteeism; team failure. Issues suspected to contribute to the problem include: unwritten philosophies and policies; written policies and practices; unreported errors and potential errors; threat of litigation; lack of management perspective; dispersed management responsibility; lack of methodical risk management; lack of cultural leadership; unstructured team-building; lack of team maintenance; unfamiliarity with systematic training.

Inclusion and Exclusion Policy

The proposed literature inclusion policy is to focus on management issues in healthcare institutions relevant to preventable error and training. Examples: Annual reports of institutions focused on healthcare quality and safety such as the Joint Commission and AHRQ; systems engineering initiative for patient safety model (SEIPS) and Latent Safety Threat (LST) analysis. The literature exclusion policy is to avoid the following as tangentially related but not directly relevant:

* narrowly-focused research on specific clinical procedures such as laparoscopic surgery, intubation or endoscopy
* the use of information technology (IT) to reduce inter-departmental communications errors such as misinterpreted drug prescriptions
* systems that affect administrative errors such as patient admission and identification systems
* misdiagnosis of pathologies
* malpractice litigation
* lists of clinical competencies
* opinion and editorial pieces
* the efficacy of checklists for improving patient safety
* research about whether simulation training improves patient outcomes

The historical context of this literature review is marked by the following salient events:

1. The US Air Force published a manual on how to document human performance requirements (1964).
2. The US Air Force published a five-step process for designing and implementing systematic training to meet human performance requirements (1965).
3. Following the review of the Three Mile Island incident, the US Congress passed the National Nuclear Power Plant Personnel Training Act of 1985.
4. Runciman et al. published a proposed framework for understanding “adverse incidents” in healthcare (1998).
5. The Institute of Medicine published the report *To Err is Human* (2000); the report estimated the national death toll due to preventable error ranges between 40,000 and 90,000 lives annually, with an associated annual cost ranging as high as $27B.
6. Henriksen and Dayton of the Agency for Healthcare Research and Quality (AHRQ) published “Issues in the design of training for quality and safety” (2006) in which they recommended exploring “systematic approaches” to training clinicians.
7. Crew Resource Management (CRM) training was gradually adapted from aviation into the healthcare professions.
8. In her quantitative doctoral research, Judith Kaplan found “no significant correlation between leaders’ perceptions of quality of care and the frequency of medical errors,” suggesting that “some hospital leaders are disconnected or dismissive of the medical error problems in their organizations” (Kaplan, 2008).
9. *The Reform of Healthcare: Shaping, Adapting and Resisting Policy Developments* (2011). Discussion of British experience with the “implementation gap” between policy and practice. Only five instances of the term “training” appear in 256 pages; there is no mention of “systematic” in connection with training.
10. The Joint Commission pointed out the significance of investing in redesigning training to build a high reliability organization (Chassin & Loeb, 2013)
11. *Quality Management and Managerialism in Healthcare: A Critical Historical Survey* (2014). Only three instances of the term “training” in 223 pages; there is no mention of “systematic” in connection with training.
12. Qualitative research across Army medical sites reveals “no clear strategy for implementing and organizing for High Reliability” that results in “lack of resources in terms of training and time” (Kapec, 2017).
13. The journal *Health Affairs* published “Two decades since *To Err Is Human*: an assessment of progress and emerging priorities in patient safety” (2018). The article includes two instances of the term “training” but no mention of “systematic training.”
14. The Joint Commission’s on-line video on achieving high reliability contains no mention of “training” (2018).

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

The purpose of this chapter is to describe the design of the research and the specific methods that will be employed to conduct it. The basic design issue—qualitative versus quantitative—was decided by attempting to answer the following question: What do I not know, that if I knew I could take the next constructive step? The possible answers to this question at this point in time do not include statistical analysis of differences and correlations among measures and groups; the nature and scope of the challenge is not yet clear enough to know what measures and what groups would be relevant. Therefore, quantitative investigations will have to wait until a qualitative design has brought more insight into the nature and scope of the challenge.

Research Questions

It is not known what organizational and cultural barriers in healthcare institutions may be preventing the use of systematic training to reduce preventable error.

Overview of Information Needed

The information sought in this inquiry are the opinions, insights and experiences of decision makers in healthcare institutions that could help characterize barriers to the use of systematic training to reduce human error. These barriers will be considered initially in terms of two interrelated conceptual categories: organizational and cultural (Table 1) (Winter et al., 2014; Ziegenfuss, 1991). The researcher has developed a theoretical construct that illustrates how these categories are interrelated in organizations. The researcher proposes to use these two nominal categories as a simple starting framework to frame interview questions and so begin organizing the data so that a substantive theory will emerge (Glaser & Strauss, 2009). It is understood that this starting framework may also have to be progressively modified or even abandoned as the data indicates.

Organizational barriers usually have concrete artifacts by which they may be identified: published manuals and handbooks that contain philosophy and policy statements; posted metrics about department performance; and memos about financial and risk management. Some unwritten administrative practices may be considered as organizational barriers. The physical layout of workspaces will be considered in this category.

In contrast, cultural barriers rarely have concrete artifacts; they persist and propagate almost solely through informal communication, both verbal and nonverbal. Social practices that powerfully affect the formation and function of professional teams fall in this category. It is assumed that multiple cultures may exist within each organization. For the purposes of this research, this category is based on Schein’s operational definition of group culture (2004):

…a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.

Table 1. Illustrations of Organizational and Cultural Phenomena

|  |  |
| --- | --- |
| Organizational Phenomena | Cultural Phenomena |
| Published artifacts: employee handbooks, organizational charts, process flow diagrams, department performance metrics, posted policies regarding risk management, financial management and compensation.  Physical layout of workstations, offices and break rooms. | Unwritten philosophy statements (aphorisms) and policies  Patterns of informal communication  Unwritten behavior protocols  Social distancing and stratification  Conflict avoidance  Team malformation and discord  Manifestation of fear and/or disdain Administrative practices concerning investments in patient safety, individual promotion and compensation. |

Theoretical Constructs

NASA research on well-organized, high-reliability organizations (airlines in North America adapting to increasing automation in the cockpit) revealed a hierarchy of practices, procedures, policy and philosophy (Degani & Weiner, 2017) (Figure 2). Practices are what people actually do that are not written out. When they are written out, they are published as procedures or checklists: concrete steps in order of execution. Procedures are governed by more general statements we call policies. One policy statement may govern numerous procedures. Finally, philosophy governs policy:

Figure 4. A hierarchy of philosophy, policy, procedure and practices, adapted from Degani and Weiner.

Philosophy

 Policy

 Procedure

 Practices

Philosophy level statements are usually both unproven and un-provable. They are powerful assertions that capture strongly held beliefs about the best way to accomplish a purpose under the operating conditions the leaders expect. They are cultural phenomena (Schein, 2004). As Table 1 indicates, while policy and procedure are usually published artifacts and are therefore best considered as organizational phenomena, philosophy and practices are not, and are best considered as cultural phenomena.

To better understand organizational culture with respect to leadership communication, the researcher has modified the Degani and Wiener model by adding two more elements: purpose and passion (Acree, n.d.). Purpose (or mission) statements are commonly encountered in institutions, and usually appear as artifacts in printed and electronic media. Purpose statements are the result of careful attention and wordsmithing and originate among the institutional leadership. In contrast, passion is the affective energy or enthusiasm that the staff bring to bear to accomplish this purpose in their practices, guided by the policies and procedures.

This framework is rarely static; leadership is necessary to keep these elements coherent, so that the passion is not diverted away from the purpose. The resulting “Six P” framework of purpose, philosophy, policy, procedures, practices and passion provides a theoretical framework for understanding institutions of all kinds and their operating cultures (*Figure 3*).

Figure 5. The researcher's Six P theoretical construct, adapted from Degani and Weiner.

Purpose

⮱ Philosophy

⮱ Policy

⮱ Procedure

⮱ Practices

Passion

The researcher proposes to use this “Six P” framework as the initial theoretical construct for seeking out information relevant to the research questions. More specifically, the researcher will seek to gain an understanding of unwritten philosophies and practices, as well as written policies and procedures, within healthcare institutions that may be working together to prevent the application of systematic training to reduce preventable human error.

Overview of Methodology

This research is proposed as a grounded theory design, with the understanding that should saturation prove elusive due to factors beyond the researcher’s control, the design may need to transition to a collection of case studies. Currently, canonical clarity about grounded theory research is still in debate (Cassell et al., 2017); this research proposal incorporates the elements generally considered essential to this research design category. The following diagram illustrates the iterative and recursive nature of this research design (*Figure 4*). In the central spiral process (vertical chain of interlocking cycles) the researcher iteratively infers tentative theories from data collected, using inductive reasoning. Later, the researcher recursively subjects these theories to deductive testing for “goodness of fit” against the data and refines or rejects the tentative theory accordingly. Memo-ing will occur throughout the process to document the reflexive investigative-theorizing-testing journey.

Figure 6. The Proposed Grounded Theory Research Process.

**Inductive Reasoning**

Selective coding: one category is selected to play the central role

Axial Coding: Influence/causal relationships are tentatively hypothesized

Influence/causal relationships are tentatively illustrated

Open Coding: Data elements   
are tentatively categorized

**Deductive Testing**

\* “Memoed” activity

Selection of grounded theory over other qualitative designs was driven by a combination of the following factors:

* The insights the researcher has gained from working with *positive deviants* (Baxter et al., 2019; Singhal & Svenkerud, 2019; Spreitzer & Sonenshein, 2004) who have over many years invested significant personal time and energy into preventing human error in healthcare
* The complex symbiotic partnership of organizations that usually constitute what is popularly viewed as a single entity: the local hospital
* The need for a theory (such as “force fields”) to inform civil and commercial policy makers and state regulators about what steps to take first

Instrumentation.

The researcher serves as the instrument (or “participant-observer”) in qualitative research (Tracy, 2019). As the instrument, the researcher brings to bear his experience and expertise to conduct each phase of the research operations plan. The researcher’s “positionality” and its influence on the process is not ignored; rather it is considered in advance as both an asset and a liability in the “give-and-take conceptual construct” to be employed in the interview process (Bryant, 2019). The asset characteristics include:

* Occupational positionality. The researcher is neither a clinician, nor an attorney, nor an executive in a healthcare institution; nor has he ever been, nor is he planning to apply for such a position. This makes his perspective an asset, in that the researcher is not subject to career pressures likely to be in play. The researcher’s occupational background includes extensive experience with high reliability organizations and the systematic training philosophy they employ to avoid, minimize and mitigate preventable human error.
* Educational positionality. The researcher’s formal education in several engineering disciplines provides a “systems perspective” that values observed phenomenon and tested theory. The choice of a social research doctorate program reflects the researcher’s lifelong conviction that the most challenging problems are psychosocial in nature.
* Age and infirmity positionality. The researcher’s age (early 60s) is an asset in that his career objectives are satisfied and therefore not likely to influence his objectivity (e.g., contribute to confirmation bias).
* Racial and ethnic positionality. The researcher’s race and ethnicity are not relevant to the issues of implementing systematic training to reduce human error.

**Operationalization.**

The component activities of the iterative and recursive flow are:

* select potential participants for interviewing;
* obtain access to participants;
* earn their trust;
* explain the purpose and method of research;
* conduct constructive interviews; assess responses to questions;
* clarify terminology;
* frame follow-up questions;
* explain the alternative paradigm (systematic training);
* record interview responses;
* transcribe responses into text files;
* upload text files and scanned artifacts into ATLAS.ti;
* reflexively analyze responses to elicit meaning and significance;
* search and sort text files in ATLAS.ti to develop categories;
* synthesize theories about categories by inference;
* evaluate theories deductively against the collected data;
* summarize the findings;
* design graphic illustrations to illustrate influence between the categories;
* validate the findings in final interviews with the participants.

The method of inquiry begins with identifying potential participants by their senior management position in healthcare institutions and then seeking face-to-face interviews with those deemed likely to have either observed or experienced the phenomena in view. Up to 20 participants will be interviewed to explore their knowledge, beliefs and attitudes relevant to preventable human error in general and more specifically to implementing systematic training in healthcare institutions. Multiple sites (and where possible, multiple institutions collaborating at a single site) will be sampled; written materials that might indicate relevant institutional policies and procedures will be collected. Individuals targeted for interview will be identified by means of focused inquiry and inspection of publicly available organizational information. The effort to identify prospective participants and obtain interviews will be documented in a research journal.

The researcher proposes to use ATLAS.ti as the repository for data collected from the interviews. Handwritten notes from interviews will be transcribed verbatim into text files for upload into ATLAS.ti, and relevant artifacts will be stored in their original electronic form or digitally scanned/photographed. The research plan includes two rounds of interviews with each participant, separated by about 45 calendar days, followed by a third and final validation interview. The interval of 45 days should allow the research participants sufficient time to observe and intentionally note any relevant organizational and cultural phenomena described by the researcher in the initial interview. When possible, the interviews will be conducted mid-month to better enable the participant to focus on the interview questions. Two rounds will enable better development of trust between the participants and the researcher, allows clarification of figurative language and abstract phrases, facilitates long-term collaborative relationships, and also enables informed development of more focused second round questions. During the third and final interview, the participant will be asked to evaluate the researcher’s synthesis for validity.

The interview questions for the initial round will be open-ended and broadly related to the central research question. The researcher will employ proven conversational techniques to “draw out” the inner conversations per Proverbs 20:5 (Good, 2017). More specifically, the researcher has modified Moustakas’ generic questions to fit the research question and the participants’ context (see table below).

Table 2. Interview Framework Questions

| Moustakas’ “Generic” Questions\* | Modified Interview Questions | Rationale |
| --- | --- | --- |
| 1. What dimensions, incidents and people intimately connected with the experience stand out for you? | What published policies does the institution have that you think affect preventable human error here? | Policies are the focus of executive-level management discussions; they govern procedures. Published policies are concrete artifacts that represent some of the philosophical commitments of the executive leadership. |
| 1. How did the experience affect you? What changes do you associate with   the experience? | How do these policies affect you and your staff—how you do things? | “How you do things” is a question about the operational institutional culture (unwritten practices). This question sets the stage for working “backwards” through the 6 P model to expose any unwritten institutional philosophy driving the practices. |
| 1. How did the experience affect significant others in your life? | Have there been preventable errors (with or without M&M) that caused these policies to take their present form? | Most of what we do is a reaction to something else, especially a disturbing event. When trained professionals know they made a preventable error, it can be a disturbing memory that leads to changes in operational policy. |
| 1. What feelings were generated by the experience? | How did these errors affect your attitudes and the attitudes of your staff toward their work in this institution? | “Attitudes” is intended to open the door further to the affective domain. |
| 1. What thoughts stood out for you? | What approaches to preventable error have you heard about in other institutions? | This question opens the door to conversation about “benchmarking” and “best practices” that might be borrowed from other fields of endeavor, such as aviation and nuclear power production. This kind of conversation is a precursor that allows the researcher to introduce the “alternative paradigm” (systematic training) at the proper time. |
| 1. What bodily changes or states of mind were you aware of at the time? | With respect to preventing human error, how would you do things differently in this institution if you had all the authority and resources you needed? | This question opens the door to identifying any change management challenges—which might include the barriers to implementing systematic training. |
| 1. Have you shared all that is significant with reference to the experience? | What (if anything) has this conversation brought to mind that I have not asked about? | Moustakas’ last question is closed-ended (answered with yes or no). The revised question follows Moustakas’ intent—to invite the participant to reveal further insights that have not yet been drawn out. |

\* Moustakas, 1994, p. 116

Coding.

To describe different phases of grounded theory method, qualitative researchers use the term “coding” in the current literature as the central analogy. Each phase is labelled with a variation on this term as shorthand substitutes for plain English phrases. For example, a plain English translation of “open coding” is “developing categories for the data, and putting data into these categories”; “axial coding” means “evaluating the links between categories in search of influence and possibly causality”; and “selective coding” means “selecting a category, usually related directly to the research question, to serve a central role in the influence/causality theory” (Hallberg, 2006). Some authors add data collection tasks, such as asking questions and recording answers, to their definition of “open coding” (Svirakova, 2018).

The researcher will design and employ an interview protocol that facilitates “collaborative” (power-sharing or power-egalitarian) interviews (Aléx & Hammarström, 2008; Anyan, 2013). One of the primary goals of these initial interviews is to create a contextualized “pool of meaning” shared between the researcher and the research participants (Mihai, 2018; Querubin, 2011; Seidman, 2013). To accomplish this goal, the researcher will approach and overtly frame each interview as a negotiation involving issues and positions, and most importantly, interests. The overlap of interests between researcher and participant is projected to be the improvement of the institution with respect to the quality of healthcare and its costs. The goal of the negotiation will be to jointly establish an interpretation of the artifacts and observations revealed in the interviews.

The researcher will invite the research participant to adopt a safety-focused understanding of key phrases such as *systematic training* and the more colloquial *left of Boom*; these phrases will subsequently be used in a “devil’s advocate” phase of the interview. This phase is designed to “empower the participant to see the world in a different way” (Tracy, 2010). In this phase, the participant will be “challenged to consider an opposing view or explanation to a situation” (Merriam & Tisdell, 2015): namely, that the participant’s institution could mitigate the many costs of preventable human error by adopting a systematic approach to training clinicians, and that something is preventing that future from being realized.

The researcher will attempt to defer participants attempts at “problem-solving” during the interviews. This will take the form of alerting the participants who begin to propose solutions before a clear understanding (of the elements and their relationships) has been achieved, and directing their attention back to clarifying these elements. The researcher anticipates that some of the participants will want to continue to work together with the researcher on solutions that may overcome the barriers, once the research has been completed.

The researcher will record participant responses in note form in a research journal (Creswell & Poth, 2018), and with participant permission will make audio recordings. The researcher will explicitly invite participants to maintain professional contact to collaborate in ensuring the quality and value of the research. In the interest of credibility, authenticity and integrity of the research outcomes, the researcher will actively seek “rich and thick” descriptions of the phenomena in view as well as negative or disconfirming responses from each participant. Conversational technique will be aligned with the goal of creating “a shared pool of meaning.” Audio recording of interviews will be at the discretion of each participant due to the perceived personal professional risk that it might engender in their minds.

In the interview notes, the institutional role of the participant will be broadly categorized, but the identity of institutions and participants will be encrypted along with their geographic location. Subsequent to each interview, participant responses will be analyzed for recurring themes and “meaning units” that might reveal the essential characteristics of the barriers (Creswell & Poth, 2018); a digital audit trail of the researcher’s analysis and reflexive review will be established by means of written electronic memoranda stored in a searchable data base (e.g., ATLAS.ti®). This database will also be used to record peer and mentor review comments. The researcher will systematically re-examine the research assumptions for validity after the first round of interviews, and again at the conclusion of the second round.

A second round of more focused interview questions will be designed based on the responses from the first round. After the second round of interviews has been analyzed, the encryption algorithm and all record of the identity of the participants and of their respective institutions will be physically destroyed.

Responses from the participants that either defy categorization or seem to contradict the tentative theory(s) developed from the data will be identified as possible “outlier” data. All data identified as “outlier” will receive thorough consideration with respect to the question of whether to modify tentative theory to better accommodate the data, or assume that the tentative theory is limited in application due to factors not yet apparent. The researcher will tentatively characterize these factors and frame each one as future research questions.

Triangulation.

In the literature, triangulation in grounded theory research appears to be a subjective process that does not appear to have an objectively defined end point. It does not have a mathematical basis. In other words, it’s a confidence that the researcher senses when sufficient repetition occurs in the data (“saturation”) given the ambiguity of interviewing people about a highly sensitive subject and subjectively interpreting their responses. The researcher proposes to achieve triangulation via reflexive iteration between the participant’s responses and the researcher’s memos (Bryant, 2019).

Ethical Compliance

Each prospective participant will be instructed in advance of the purpose of and methods to be employed in the course of this research, and before their first interview they will be asked to sign a consent-to-participate form. This form will describe the purpose and anticipated benefits of the research, any risks involved, how their institution’s identity, their personal identity and their responses will be protected as confidential, and how their responses will be used over the course of the research. The participants in this research will not be exposed to any harmful chemicals or clinical procedures.

Demographic Data

Demographic data that will be collected include the participant’s age bracket, current institutional role, years in that role, previous institutional roles and years in these roles.

Analysis and Synthesis of Data

The textual materials and interview notes will be encoded and organized into themes using a “spiral approach” that is iterative and recursive and concludes with synthesizing interpretations (Creswell & Poth, 2018).

Issues of Trustworthiness

In this research design, and more especially in this litigation-prone research area, trust between researcher and interview participants is a paramount concern. From the perspective of the participant, issues of trustworthiness include: protection of their identity and the identity of their respective institution; the researcher misunderstanding or misconstruing their responses, either intentionally or by accident; the researcher “massaging” their responses after the interview to satisfy the researcher’s bias. From the perspective of the researcher, issues include: the participant hiding their relevant insights; the participant purposely distorting their insights.

Researcher Bias

The bias of the researcher consists primarily in a long association with systematic training and its application to reduce preventable human error. The researcher was first exposed to systematic training as a trainee in a year-long military pilot training program. The researcher subsequently was trained to serve as a military flight instructor within a formal training organization that implemented a systematic training design. This included the researcher instructing aircrews in Crew Resource Management (CRM), an error mitigation strategy initially developed by United Airlines and subsequently adopted by the military. This experience drew the researcher into study of human error modes such as “groupthink” and confirmation bias. Later, for two years the researcher commanded a military organization whose sole mission was formal (systematic) training in aviation. The net effect of having served in military aviation training is a conviction that *systematic training saves lives*.

Following two decades of military service the researcher served as a consultant in both nuclear industry and military aviation, and tentatively explored the application of systematic training in healthcare. Serendipitously, the researcher has worked with professors of anesthesiology and retina surgeons on clinical training issues. The work with retina surgeons resulted in a quantitative research design and the results were published in a peer-reviewed medical journal (Grodin et al., 2008). The researcher was also asked to contribute a chapter to a seminal book on the use of simulation for clinical skills training (Kyle & Murray, 2010). The researcher is aware that this background of experience with systematic training is an asset, but can also be a liability in that it may result in confirmation bias.

The researcher’s personal experience with morbidity due to human error in healthcare is relatively minor. A doctor persistently mismanaged the researcher’s medication for an extremely painful nerve disorder. A nurse damaged the researcher’s wife in the shoulder by misplacing a hypodermic needle during a routine injection. In contrast, the researcher underwent precision neurosurgery that was completely successful. Overall, the researcher’s personal experience with healthcare has been positive.

Researcher’s Worldview

A researcher’s worldview, in addition to providing the fundamental motivation for the work of research, shapes both their selection of research topics and their interpretation of the data (Creswell & Poth, 2018). For example, a researcher embracing the Marxist worldview would tend to view the research through the lens of economic class (Seidman, 2013) and materialism (Sowell, 1985). Likewise, a post-modern researcher would reject all foundational concepts, absolutes and metanarratives as means for making sense of the data collected (Veith, 1994).

This researcher embraces the historic Christian worldview. In this worldview, subjective reality-as-experienced is understood as anchored in an objectively-knowable ultimate reality whose creator and governor is both personal and infinite (Frame, 1987; Pearcey & Thaxton, 1994; Sire, 2009). This means that knowledge of both subjective and objective reality is worth the effort to acquire by rational means (Kuyper, 1994; Schaeffer, 1983). More profoundly, rational human inquiry finds its sole source of validity in dialogue with the infinite personal creator who both reveals Himself in the Bible and also invites us to explore the fundamental regularity of the natural world He created and governs (Frame & Til, 1995; McGrath, 1993). In this dialogue, a *Trinity-centric*, rational pragmatism (King-Farlow & Christensen, 2012; Stier, 1996) emerges that, while it shares some common characteristics with the man-centric secular pragmatism usually associated with the origin and foundation of grounded theory research design (Chamberlain-Salaun et al., 2013; Morgan, 2020), is epistemologically more robust than its metaphysically-truncated secular cousin. This Trinity-centric pragmatism provides the “general sociological perspective” by which initial decisions have been made for designing this research (Glaser & Strauss, 2009).

Validity

Validity of the research will be constructed recursively in three domains (Dennis et al., 2013). The first domain is the researcher’s understanding the research participants, and vice versa. Validity in this domain will be constructed by careful listening, questioning and verbal confirmation. The second domain is the researcher’s self-reflective understanding of his own involvement in the act of constructing shared meaning with the research participants. Validity in this domain will be constructed recursively with the aid of professional and scholarly interlocutors. The last domain is how accurately the researcher publicizes the dialogue between researcher and participants. Validity in this last domain will also be constructed with the aid of interlocutors, including research committee members and the OGS Society of Scholars.

Limitations

This research will be limited by the willingness of managers and executives: to participate, and to reveal information that may be potentially damaging to the institution or may expose it to litigation. Therefore, a significant limitation will be imposed by the degree and scope of participant trust earned by the researcher over the course of the interviews. It will also be limited by the degree of communication skill possessed by the participants and by the researcher.

Addendum to Chapter 3

As of the Spring of 2023, the researcher’s efforts to identify and recruit participants has not been sufficiently successful. Seven participants from a variety of professional healthcare backgrounds agreed to interviews; some of these provided useful insights. Others either did not respond to invitations or, on seeing the informed consent information, asserted that their participation was an unacceptable litigation risk. The researcher consulted with the dissertation committee chair, and consistent with the backup plan agreed to earlier, decided to transition to a case study design for qualitative research.

The research remains guided by the original challenge: It is not known what organizational and cultural barriers in healthcare institutions may be preventing the implementation of systematic training to reduce preventable error.

The transition to case study design does not require significant change to the more specific research questions originally pursued in the grounded theory inquiry:

1. What organizational barriers might be preventing the implementation of systematic training to reduce preventable human error in healthcare institutions?
   1. What written policies and procedures are in place that might affect training to reduce human error?
   2. What financial management issues exist that actively hinder logical assessment of investments in training with error consequence management?
   3. What career progression issues hinder management from focusing on systematic training?
   4. How does the threat of litigation affect an institution’s approach to managing preventable human error?
2. What cultural barriers might be preventing the implementation of systematic training to reduce preventable human error in healthcare institutions?
   1. What unwritten philosophies and policies hinder consideration of systematic training to prevent human error?
   2. What professional communication issues hinder consideration of systematic training to prevent human error?
   3. What attitudes hinder consideration of systematic training to prevent human error?

Case Study Research Design

At least five components are considered important for case study design (Yin, 2018):

1. The case study questions;
2. The case study presuppositions, if any;
3. The case(s) under study;
4. The logic linking the data to the presuppositions; and
5. The criteria for interpreting the findings.

Presuppositions Relevant to this Case Study

In addition to the presuppositions of the researcher’s worldview, the following presuppositions are also at work in the design of the research:

1. The judicious selection of case(s) to be studied will enable the researcher to identify and explore the organizational and cultural factors in healthcare institutions that may be preventing the implementation of systematic training to reduce human error;
2. The barriers to implementation of systematic training to reduce human error may be a complex, multi-dimensional array consisting of multiple organizations, departments and professional labor categories, all of which exhibit diverse purposes, philosophies, policies, procedures and practices.
3. The Six P framework of leadership communications based on the research of Degani and Weiner provides a useful starting tool for interpreting the data collected during the case study interviews;
4. The researcher has sufficient skill in framing questions that will guide the participant(s) adequately to explore the organizational and cultural factors in healthcare institutions that may be preventing the implementation of systematic training to reduce human error;
5. The participant(s) selected for interview will both understand and help the researcher apply the Six P framework for categorizing phenomena relevant to preventable human error as either *organizational* or *cultural*;
6. The participant(s) selected for interview will have observed organizational and cultural factors in healthcare institutions that may be preventing the implementation of systematic training to reduce human error;
7. The participant(s) selected for interview will have rationally interpreted any observed organizational and cultural factors in healthcare institutions that may be preventing the implementation of systematic training to reduce human error; and
8. The participant(s) selected for interview will be able to help the researcher explore the effect of organizational and cultural phenomena on potential investments in systematic training to reduce human error in healthcare.

Selection of the Case(s) to be Studied

The researcher will select the case(s) based on the following criteria:

1. Institutional “field of view.” The selected research participant must have occupied a position in a healthcare education organization that allowed sustained observation of
   1. clinical skill training challenges;
   2. philosophies, policies and procedures among the clinical skill training faculty;
   3. clinical training faculty practices; and
   4. healthcare management philosophies, policies and procedures.
2. Attitudinal Disposition. The selected research participant(s) must demonstrate evidence of:
   1. studious analysis of organizational and cultural phenomena; and
   2. a personal devotion to improving the quality of training, and more specifically to the reduction of human error in clinical practice.

Case Study Questions and Interview Protocol

Because the case study will focus on an individual whose professional background is already known to the researcher, the researcher has reframed the original research questions to form a *line of inquiry* for use by the researcher. For example, a line of inquiry can be composed of different kinds of questions framed by the purposes of the inquiry (Brown et al., 2013):

Invitations: Open-ended requests for free-recall reports or elaborations that do not focus on a particular type of information, but elicit narrative (multi-word) responses.

Cued invitations: Open-ended requests for additional free-recall elaboration on what the participant has disclosed.

Directive: Open-ended requests for further details on aspects of previously reported information, formulated as ‘wh’ question. Elicit single word or phrase-based responses.

Option-posing: Introduce interviewer-generated input, asking the participant to affirm, negate, or select interviewer-given exhaustive options, formulated as yes/no or forced-choice questions, thus tapping recognition memory processes.

Suggestive: Prompts stated in a way that communicates response expected, or assume details not reported by the participant. Formulation may vary (e.g, like invitation, cued invitation, directive, or option-posing questions) and thus volume of response may also vary.

For this case study the line of inquiry is designed as a sequence of purposes with which to frame questions during the interviews:

1. explore the participant’s background (demographic, educational, vocational, professional);

2. explore the participant’s personal motivation relevant to preventable human error in healthcare;

3. explore the scope of the participant’s “field of view” with respect to organizational aspects relevant to preventable human error in healthcare;

4. explore the participant’s observations with respect to organizational aspects relevant to preventable human error in healthcare;

5. explore the scope of the participant’s “field of view” with respect to cultural aspects relevant to preventable human error in healthcare;

6. explore the participant’s observations with respect to cultural aspects relevant to preventable human error in healthcare;

7. explore how the participant interpreted his observations about organizational and cultural aspects relevant to preventable human error in healthcare;

8. explore to what degree the participant may have theorized about his observations about organizational and cultural aspects relevant to preventable human error in healthcare;

9. explore what actions the participant may have initiated relevant to reducing preventable human error in healthcare;

10. explore how the healthcare professional community responded to the participant’s initiatives relevant to reducing preventable human error in healthcare;

11. explore how the response of institutional management may have differed from the response of professional clinicians to the participant’s initiatives relevant to reducing preventable human error in healthcare;

12. explore to what degree the participant is familiar with the systems approach to training (SAT) used in aviation and commercial nuclear power to reduce preventable human error;

13. explore how the participant views SAT in general;

14. explore how the participant views the potential for SAT to address preventable human error in healthcare;

15. explore what organizational barriers the participant perceives that may hinder the implementation of SAT to reduce preventable human error in healthcare;

16. explore what cultural barriers the participant perceives that may hinder the implementation of SAT to reduce preventable human error in healthcare;

17. explore how the participant interprets his perceptions about any barriers that may hinder the implementation of SAT to reduce preventable human error in healthcare; and

18. explore how the participant may have theorized about any barriers that may hinder the implementation of SAT to reduce preventable human error in healthcare.

Logic Linking the Data to the Presuppositions

Data collected from the participant(s) will be used to evaluate the validity of the presuppositions stated above. The researcher’s Six P theoretical framework will be used to categorize and explore the effects of phenomena described by the participants, especially where these affect the implementation of systematic training to reduce human error. The researcher may modify the Six P framework based on the data collected to improve its usefulness as an interpretation tool. The participant(s)’ observations relevant to organizational and cultural barriers, interpretations of their observations, and theorizing will be used to evaluate the validity of the presuppositions.

CHAPTER 4: SUMMARY OF RESULTS

[Brief introductory paragraph.]

Objective Descriptions of the Findings

(Other headings as needed; finding are not subject to interpretation by researcher.)

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

[Brief paragraph of introduction to the chapter without a heading.]

Subjective Description of Meaning for Each Finding

Analysis related to Research Questions

Conclusions

(Typically each conclusion drawn should be tied to the respective finding and intpretations.)

Recommendations

[Appropriate Level 2 Headings of Your Choice]

Suggestions for Further Research

[BACK MATTER]

Many details are compiled in a section known as back matter. This information is more detailed than is needed for general comprehension of the purpose and outcomes of the research but is preserved in the report so that the entire process can be verified or repeated. Include all elements that were part of your research. These pages all carry page numbers.

Works Cited. All materials referred to in the text.

Related Works. (Rarely used). Materials used in the development of the project, but not cited in the text. These materials provide prerequisite or supplemental information not used in the research but that is closely related to the topic.

Appendixes

1. Consent Form
2. Interview Protocol
3. Interview Notes and Transcripts
4. Software Report

The author’s vita

Index (Rarely used)

Appendix 1

**[draft] Informed Consent Notice**

Before agreeing to participate in this research study, it is important that you understand the purpose, benefits and risks of the study and how it will be conducted. If you agree to participate, both you and the interviewer will sign this form together.

**Title of Study:** Organizational and cultural barriers to implementing systematic training to reduce human error in healthcare institutions: A grounded theory approach.

**Principal Investigator/Interviewer:** James “Lance” Acree, Lt Col USAF (ret) and PhD candidate at Omega Graduate School (OGS), an accredited research institution in Dayton, TN.

**Committee Chair:** Dr. \_\_\_\_\_\_\_\_\_\_\_.

**Purpose of the Study:** The purpose of this study is to help clarify what may be hindering the adoption of *systematic training* (such as is employed in aviation and nuclear power professions) to reduce preventable human error in healthcare. You are being asked to participate in this research study by sharing your professional perspectives on what barriers in healthcare institutions may be hindering the implementation of systematic training.

More specifically, the interviewer is seeking your professional perspectives on: (1) what organizational policies and processes (e.g., financial, career management, risk management, investment, public affairs…); (2) what cultural issues and characteristics (e.g., professional fears, inter-profession attitudes, social stratification of clinicians…); (3) which of these offer the most institutional resistance to implementing systematic training to reduce preventable error?

**Study Procedures:** We will first invite you to complete a brief questionnaire regarding your personal characteristics and professional experience. Based on responses, we may invite you to participate in a 60-minute individual interview based on historical background information we will provide to you. This interview can take place face-to-face (preferred) or via distance communication (e.g., phone or internet).

The interview will be audio recorded only if you agree. After a personal introduction and fielding your questions, the interviewer will ask for your permission to record the interview. If you elect not to have the interview recorded, the interviewer will take notes.

After two months have passed since the initial interview, the interviewer may contact you with follow-up questions. Finally, the interviewer may ask you to participate in a 30-minute interview to assess the accuracy of the interviewer’s interpretations and conclusions.

**Foreseeable Risks:** Your participation in this study poses a risk for breach of confidentiality. To minimize this risk, neither the interviewer nor OGS will use your name, your job title, your institution’s name, your geographic location, or any other identifying information in any study records, presentations, or publications. We discuss in detail how we will keep your identity information private below. You will be in control of the interview and can decide how much insight to share. Otherwise, the research team considers this study to have no foreseeable risks.

**Benefits to Research Participants or Others:** You may enjoy reflecting on your perspective with the help of an interlocutor (the interviewer), but you may not experience direct benefit from participating in this study. Results of the study may help health care policy makers better understand how to mitigate preventable human error. This understanding may be used to develop better policy, best practices in training and formulate additional research.

**Compensation for Participants:** None

**Procedures for Maintaining Confidentiality of Research Records:** Interested participants will complete a demographic survey on-line through [Qualtrics?]. Your participation in this online survey involves risks to confidentiality similar to a person’s everyday use of the Internet. We will download this initial information and keep it on a server secured by OGS until it is destroyed three years after completion of the study. Once we select interview participants, the interviewer will secure both their personal identity information and the identities of their respective institutions, including any signed copies of this form.

You will control whether any audio recording will be made during your interviews. The interviewer will de-identify recordings and assigned a control number before they are transcribed by a professional transcriptionist and analyzed. The control-number-to-participant encryption will be hand recorded only and stored in a locked container for the duration of the study. Only the interviewer and his committee chair will have access to the original audio recordings. The interviewer will keep your de-identified transcriptions on a password protected computer in a location completely separate from your demographic information. We will destroy any audio recordings, the encryption and all traces of participant identity once we complete data analysis. The confidentiality of your individual information will be protected from exposure in any publications or presentations regarding this study.

**Questions about the Study:**

If you have any questions about the study, you may contact James “Lance” Acree at \_\_\_\_\_\_\_\_\_\_\_\_\_@ogs.edu or Dr. \_\_\_\_\_\_\_\_\_\_\_ at \_\_\_\_\_\_\_\_\_\_\_\_@ogs.edu.

**Review for the Protection of Participants:**

This research study has been reviewed and approved by the OGS Institutional Review Board (IRB). You may contact the OGS IRB at (phone#) with any questions regarding the rights of research subjects.

**Research Participants’ Rights:**

Your signature below confirms that you have read all of the above and that you confirm all of the

following:

* The interviewer has explained the study to you and you have had an opportunity to contact him, his committee chair and/or the IRB with any questions about the study. You have been informed of the possible benefits and the potential risks of the study.
* You understand that you do not have to take part in this study, and your decision to withdraw will involve no penalty or loss of rights or benefits. Both you and the principal investigator may choose to stop your participation at any time.
* You understand why the study is being conducted and how it will be performed.
* You understand interviews will be audio recorded only if you grant written permission.
* You understand your rights as a research participant and you voluntarily consent to
* participate in this study.
* You understand you may print a copy of this form for your records.
* You understand you will receive a copy of this form once it is signed.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Printed Name of Participant

Authorization of Audio Recording Interviews: □ Decline □ Approve

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature of Participant

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature of Interviewer

[OTHER BACK MATTER]

Anything else that is important to add follows the appendixes. Such items, which are optional and depend upon the nature of a particular project, could include:

Bibliography (materials consulted that contributed to your project but not cited)

Sources recommended for further information on the subject of the research

These are used uncommonly, but if you have materials that you believe must be included to enable optimal comprehension and use of the content, talk to your advisor about including them. Extraneous material diminishes the credibility of the study.

WORKS CITED

This is a list of all the books, journal articles, and information from other sources that are quoted or paraphrased in the report. APA 6th calls this a Reference List, but we prefer Works Cited. Follow precisely the correct style shown in APA 6th (6.22-6.26, p. 180-183 and especially pp.193-215). Double space throughout with ½” hanging indent. Degrees and first names are not included in either references or in parenthetical citations (where initials are also omitted).

Everything in Works Cited must be used in the body of the report; every parenthetical citation in the report must be detailed in Works Cited. When you have finished all writing, print a copy of your Works Cited. Go through the text from start to finish to look at each parenthetical citation. If it is in Works Cited, put a check mark beside the listing. Then, see if you have any entries in the Works Cited that do not have a check mark. If you do, either delete it (it doesn’t belong because you didn’t use it) or see if you may have missed it when you went through the first time.

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RELATED WORKS

Works read in preparation for a research study but not quoted, and thus omitted from the Works Cited section, may be listed alphabetically in an optional section entitled Related Works placed immediately after the Works Cited. The references follow the same APA 6th format. Use only if the information is useful to the reader lest you appear to be padding your report.

APPENDIX A

TITLE OF APPENDIX

APPENDIX A: TITLE OF APPENDIX

The plural form of “appendix” may be either “appendixes” or “appendices.” The dictionary followed by APA 6th (Merriam-Webster’s Collegiate Dictionary, 2005) shows “appendixes” as the preferred form, as do most other current dictionaries. The appendixes follow immediately after the Works Cited and are placed in the sequence in which their material appears in the body of the dissertation. The appendixes that are included depend upon the nature of the research. Each has a title page identified by a letter—A, B, C and so on. (This book does not follow that practice.) Should you have more than 26 (!), continue from Z as AA, AB, AC.

An appendix may contain only one item although that item may be multiple pages. For example, a survey would be in one appendix, but a permission form for a minor child to fill out the survey would be in another. Include all material that would help a naïve reader to comprehend exactly what you did, but only if the material is relevant. Do not open yourself to criticism of padding out a weak report.

Side margins of an appendix may be narrowed to accommodate a data table, but reducing the size of the table is generally preferred. If the size of a figure or historical document is reduced, insert that information on the title page for that appendix (E.g., Map is 80% of actual size.)

Any instruction or other information given to participants. If given orally or by

recording, include the script.

Letter requesting permission to do research at a location

Authorization received in response to a request for permission.

Forms for permission, release of information, or waiver of liability

CURRICULUM VITAE

A one-page vita is placed immediately after the last appendix. The vita includes significant summary information, including: date of birth; granting institution for previous college degrees with dates, degree nomenclature, and field of study; a brief summary of employment; and any other facts (such as awards) that describe your qualifications as a researcher. The information is limited so that it fits on one page with adequate white space.