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### **A Comparative Analysis of Ready Relevant Learning in Navy "A" School Ratings**

March 2024

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**Naval Postgraduate School**

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Prepared for the Naval Postgraduate School, Monterey, CA 93943.

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## ABSTRACT

Ready Relevant Learning (RRL) is a crucial component of the Sailor 2025 initiative to modernize enlisted Navy training. Navy “A” school is vital in Sailors’ careers—its main objective is to train and prepare Sailors for their jobs in the Fleet. This study aims to assess end-of-course training scores under RRL training compared to those from legacy training from 2017 to 2023 for four Navy ratings: Logistic Specialist (LS), Personnel Specialist (PS), Retail Service Specialist (RS), and Yeomen (YN). Using a statistical regression analysis approach, I find that, while the end-of-test scores show a statistically significant small decrease in the RRL training compared with legacy, the difference did not impact “A” school graduation rates. After controlling for demographics and AFQT scores of Sailors, the analysis highlights that demographic shifts among legacy and RRL Sailors significantly impact end-of-course training scores, with more females, African Americans, and married Sailors groups outperforming others under RRL. The next step requires an assessment of test questions and learning objectives to infer the impact of the RRL on Sailors’ learning in “A” schools and contribute to the broader analysis of the effectiveness of the RRL training to prepare Sailors to meet the needs of the Navy.



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## LIST OF ACRONYMS AND ABBREVIATIONS

AFQT	Armed Forces Qualification Test
AOC	Army Advanced Operations Course
AR	Arithmetic Reasoning
ASVAB	Armed Services Vocational Aptitude Battery
BDL	Blended Distributed Learning
CeTARS	Corporate Enterprise Training Activity Resource Systems
CRESST	Center for Research on Evaluation, Standards, and Student Testing
CSS	Center for Service Support
DL	Distance Learning
FRAGO	Fragment Order
GPA	Grade Point Average
KSA	Knowledge, Skills, and Abilities
LS	Logistic Specialists
MK	Mathematics Knowledge
NETC	Navy Education and Training Center
NTTC	Naval Technical Training Center
OJT	On-the-Job Training
PC	Paragraph Comprehension
PP	Percentage Points
PS	Personnel Specialists
RRL	Ready Relevant Learning
RS	Retail Service Specialists
TAM	Technology Acceptance Model
UCLA	University of California, Los Angeles
USFF	United States Fleet Forces Command
VSH	Virtual Schoolhouse
WK	Word Knowledge
YN	Yeoman



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# I. INTRODUCTION

Ready Relevant Learning (RRL) is the Navy’s broad initiative for a training transformation. It signifies a departure from traditional training methods, pivoting towards dynamic and adaptable learning and skill acquisition models to better align with the requirements of the Fleet. Emphasizing three core principles: timing of the training, delivery methods, and maintaining relevance to real-world Fleet needs, RRL envisions a Navy where Sailors are optimally prepared for their real-world duties. The Sailor 2025 initiative to bring “Navy training into the 21st Century” (NETC, 2017) identifies gaps in legacy training methods, such as providing advanced information too early compared with the time of use and via less adaptable, traditional delivery modes—requiring Sailors to return to schoolhouse training multiple times, causing a detriment to operational tempo and fleet manning. RRL aims to leverage technological advancements to deliver training more effectively and augment sailors’ performance and mission readiness.

As the Navy has started implementing RRL in several ratings across the service, it is essential to understand better how the outcomes from the RRL training compare with those of the legacy training.

In this thesis, I use data from the RRL implementation across the “A” schools for four Navy ratings, Logistic Specialist (LS), Personnel Specialist (PS), Retail Service Specialist (RS), and Yeomen (YN), which transitioned in the 2020–2022-time frame to a blended modular training with a more focused content, delivered in a shorter time.

My research is focused on investigating the following research questions.

## A. PRIMARY RESEARCH QUESTIONS

- How does the blended module training Ready Relevant Learning (RRL) model compare with the legacy model regarding end-of-course training scores?
- How does this comparison differ by Sailor AFQT score, age, and demographics? Can these predict the training model’s success?



By transitioning to a blended-modular training approach, students are expected to yield a higher end-of-course score because they receive less information at once over a shorter time. This means students who took the RRL training curriculum should outperform those who took the previous legacy training curriculum regardless of age, AFQT score, or demographics.

This thesis uses an event-study comparative analysis approach to test scores between the legacy and RRL training curricula for four Navy customer service ratings. This approach can also help understand how any score gaps are related to the difference in the delivery method of the training curricula or other underlying factors, such as characteristics of the Sailors completing the “A” school training programs. I used The quantitative approach based on linear regression, as discussed in Miller (2023), to assess any changes in the grade point average scores (GPA) following the policy shift to RRL. Subsequently, the analysis incorporates student demographics, age, and AFQT scores to evaluate their influence on the final GPA. A regression analysis for each rate determines if outcomes are rating-dependent. Parallel to this, I will compare the curriculum learning objectives between RRL and legacy training to ascertain their alignment. Additionally, to support the validity of the findings, I investigate whether test difficulty remains consistent across the two training approaches.

The rest of the thesis details the RRL initiative and how it was implemented in the four ratings I include in my analysis. Then, I review the literature to document relevant findings and methods that help shape my approach and validate the findings. In my conclusions, I also offer thoughts on what I learned and what could be the next steps in assessing the implementation of RRL across different ratings in the Navy.



## II. BACKGROUND

The United States Navy, in its pursuit of excellence and operational readiness, has long recognized the need for continuous evolution in its training methodologies. The Sailor 2025 initiative epitomizes this goal to modernize training to meet the needs of Sailors and the Navy (NETC, 2017; FRAGO, 01/2019). It is a comprehensive effort to transform how the Navy trains its personnel, ensuring that sailors are prepared for their current roles and equipped to adapt to the rapidly changing demands of naval warfare and technology. At the core of this transformation is the Ready Relevant Learning training, an approach designed to overhaul traditional schoolhouse training systems.

As illustrated in Figure 1, RRL emphasizes three pillars outlined in NETC Vision and Guidance for Ready Relevant Learning 2017.

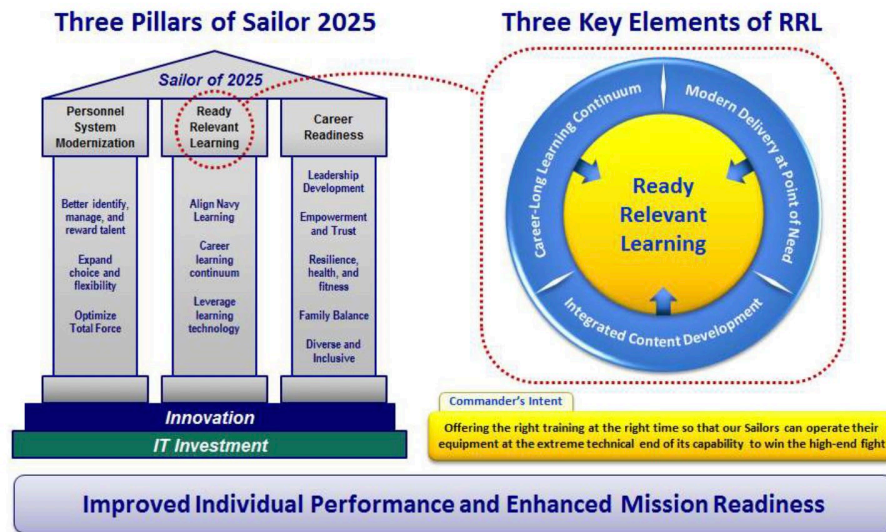


Figure 1. Three Pillars of Ready Relevant Learning. Source: (NETC, 2017)

The Career-Long Learning Continuum stresses continuous learning received throughout a Sailor's career, shifting from an early-career focus to lifelong learning opportunities. Modern Delivery at Point of Need emphasizes leveraging technology for on-demand, relevant training in dynamic operational settings, keeping Sailors closer to the

Fleet. Integrated Content Development focuses on tailoring training to Fleet-Validated needs and practical Sailor duties, and it is designed to replace outdated traditional training methods with a blended-modular learning approach. (NETC, 2017).

This transformative approach begins at the Navy Accession Level Pipeline. Basic training introduces recruits to military life, followed by specialized technical training at “A” schools. Under RRL, training in these schools for rates such as Logistic Specialist (LS), Personnel Specialist (PS), Retail Service Specialist (RS), and Yeoman (YN) have been revamped. These rates represent a significant portion of the Navy’s manpower and are crucial for the Fleet’s operations and overall effectiveness.

A critical aspect of this transformation is comparing training outcomes, primarily through end-of-course scores. These scores reflect the knowledge and skills sailors acquire during training, measured by tests throughout the training. The comparison also considers the influence of Sailor profiles, including AFQT scores, age, and demographics, on training outcomes. Recent adjustments in the Navy’s enlistment criteria, particularly the AFQT score requirements, play a significant role in shaping the sailor workforce and, by extension, their performance in training programs.

This research is essential in the Navy’s ongoing training transformations. By comparing the RRL model with legacy training methods, the study aims to provide insights into the effectiveness of the new training. The findings will help drive future training strategies, ensuring that sailors are well-prepared for their immediate roles and capable of adapting to the evolving demands of naval service. RRL is the future of Navy training and education. To maintain Fleet operational readiness and effectiveness, we must continue to assess and revise courses to deliver the best training available to Sailors.

Navy Technical School, better known as Navy “A” school, is the first introduction Sailors have to their rating, or job specialty, after boot camp. At “A” school, sailors learn the working knowledge and basic skills needed for their first fleet assignment. They report directly from boot camp to their “A” school for training. The rates selected for this study are Logistic Specialist (LS), Personnel Specialist (PS), Retail Service Specialist (RS), and Yeomen (YN). These rates were selected because, in some circumstances, “A” school is



not required; they are similar, being Navy customer service ratings, and have all transitioned to Ready Relevant Learning curriculums. These rates fall into two categories: the administrative ratings of PS and YN and the supply ratings of LS and RS. YN and PS Sailors account for 7889 active-duty (BUPERS 2023a; BUPERS 2023b), and LSs and RS account for 10,836 active-duty Sailors (BUPERS, 2024a; BUPERS, 2024b). Statista reports 280,674 active duty enlisted Sailors in 2023, meaning that these four rates comprise seven percent of the entire Fleet (Statista, 2023).

All Navy ratings require an Armed Forces Qualification Test (AFQT) score, which plays a role in determining enlistment eligibility and assigning Sailors to their respective rates. The AFQT, a portion of the ASVAB (Armed Services Vocational Aptitude Battery), evaluates suitability for enlistment in the United States Armed Forces by testing four essential areas: “Arithmetic Reasoning (AR), focusing on basic arithmetic problem-solving; Mathematics Knowledge (MK), assessing understanding of mathematical concepts; Word Knowledge (WK), measuring comprehension of word meanings; and Paragraph Comprehension (PC), evaluating understanding of written material” (Goering, 2022). The AFQT score is a composite score derived from these areas. It is expressed as a percentile, comparing a test-taker’s performance with a national sample of 18- to 23-year-olds, where a higher score indicates better performance.

Traditionally, the Navy has required a minimum AFQT score of 31. However, a waiver implemented in December 2022 allows enlistment with a score as low as 10, aiming to boost recruiting efforts and provide opportunities to more prospects (Goering, 2022). This score not only determines eligibility for military enlistment but also factors significantly into assigning Sailors to specific Navy ratings, ensuring that individuals are placed in roles that align with their aptitudes and skills as indicated by their AFQT performance (Goering, 2022).

Figure 2 illustrates the AFQT scores before and after RRL was implemented, and overall, there is a noticeable decrease in students’ AFQT scores entering the RRL training pipeline. According to Goering (2022) and Mongolia (2022), the Navy missed its recruiting goal in 2022, and to address the recruiting issue, the Navy lowered its ASVAB and AFQT requirements. Figure 2 shows a significant drop in AFQT scores, noting the spike of lower



scores 20 and 40. Based on the lower AFQT scores, it is reasonable to deduce that the Navy is admitting lower academically qualified Sailors, and it would be expected to see “A” school end-of-test scores decrease as well. However, in Figure 3, that is not the case. Scores are more distributed but not as dramatically different as in Figure 2.

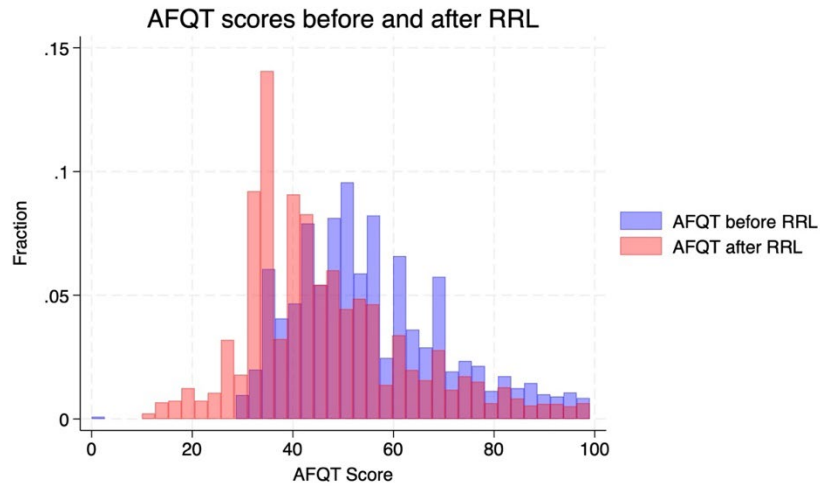


Figure 2. AFQT scores before and after RRL. Data source: (Center For Service Support (CSS), personal communication, July 31, 2023)

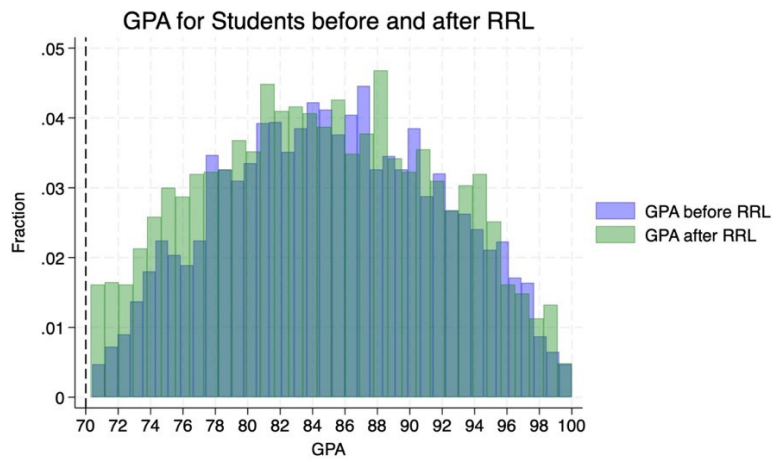


Figure 3. GPA of “A” school students before and after RRL. Data source: (CSS, 2023).



The minimal change in end-of-course scores could be a result of an array of factors such as tests getting easier, RRL transforming Sailors with lower academic ability into academically stronger students, or we do not see a corresponding drop in test scores to AFQT score because there has been a change in types of Sailors that the Navy recruits and this change in recruiting has helped mitigate this change.

Administrative and Supply Ratings are also not the ratings that are considered to “win wars,” but they are imperative to Navy day-to-day operations to win wars both at home and overseas; policies cannot be signed, parts cannot be ordered, ships cannot be stocked, and service and other government employees cannot be paid without these rates; it is imperative to ensure that their initial rate training is ready and relevant to prepare these Sailors to go carry out essential Fleet missions. Though “A” school is not required for these ratings, most of these rated Sailors’ attend “A” school because if they were to report directly to their command post boot camp, it would be a detriment to the Fleet stressing already understaffed commands. These “A” schools are the backbone in providing Sailors with essential knowledge, skills, and abilities (KSA) in their first Fleet assignment.

Upon completion of “A” school, students receive an end-of-course grade that reflects the average of the tests administered over training and graded on a 0–100-point scale; a 70 or higher is required to pass each test, which is laid out in the instructor testing plan, and an overall score of 70 or higher is required to pass the course. The LS, PS, RS, and YN “A” schools have nearly a 99% pass rate. With this high pass rate, it is essential that we can compare whether the different types of training methods—blended-modular training versus schoolhouse classroom training, have affected the end-of-course training scores while accounting for the impact that AFQT scores, age, and demographics have on student’s overall end of course score. This research paper studies the end-of-course scores from RRL training compared to the legacy training curriculum.



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### III. LITERATURE REVIEW

While research directly addressing differences between Ready Relevant Learning and legacy training is limited, the existing research on services' training programs, education programs, and internal reports offers valuable insights into the impact of RRL on course training scores.

#### A. NAVY TRAINING AND APPLICABILITY OF ADULT LEARNING THEORY

The Navy's RRL initiative signifies a shift in training methodology from legacy training. RRL introduces a blended-modular approach that breaks down educational content into focused units, enhancing intensive learning on specific skills and allowing for part of the training to be conducted virtually, marking a departure from traditional schoolhouse settings of legacy training (Tick, 2021). This innovative approach, blending traditional classroom instruction with modern digital tools like online courses and simulations, signals a move towards a more andragogical method in Navy training (NETC, 2017). The andragogical learning method is a learner-centered approach emphasizing self-directed, adult-oriented learning, considering adult learners' unique needs and experiences. RRL is new Navy training designed for Sailors with different knowledge abilities for all ratings, and its focus is on just-in-time training, providing sailors with ongoing education that aligns with their career development rather than condensing it at the start. This model promotes greater flexibility and personalization, addressing individual learning needs and emphasizing continuous, lifelong learning for skill maintenance and proficiency (NETC, 2017).

In contrast, the Navy's legacy training system, used by all rates, uses a more pedagogical-based approach, heavily focused on classroom-based training early in a sailor's career. Legacy training had minimal integration with technology and blended learning methods and offered limited customization and adaptability, following a one-size-fits-all model (NETC, 2017). RRL, on the other hand, is tailored to provide career-based



learning paths and just-in-time training, aligning education with sailors' immediate operational needs.

In evaluating the shift from traditional to more technologically advanced training models in the Navy, it is crucial to consider the unique dynamics of virtual learning environments. Spears (2014), for example, highlights the Navy's exploration of distance learning through virtual worlds, offering potential cost savings and practical training compared to traditional models. However, this transition requires careful consideration of how students learn differently in virtual settings compared to face-to-face instruction. For example, officers in distance learning, especially in technical courses, face academic challenges, with lower graduation rates and GPAs than in-person learners (Bacolod, 2018). Failure and withdrawal rates were also higher in the distance learning program versus the in-person courses. This could be due to balancing work and school. Distance learning students demonstrated less motivation and endurance, which is critical for completing online courses (Bacolod, 2018). Additionally, the adaptability of courses to distance formats varied, with technical disciplines less suited to online learning than less-technical ones, which will be a significant consideration when the Navy fully transitions to RRL blended-modular-based training. Technical rates, such as engineering rates, will not transition as quickly as administrative rates.

Learning theory has influenced how individuals acquire and respond to new information for years (Merriam, 1996). These theories, particularly within adult education, provide frameworks for crafting impactful training by incorporating techniques such as reinforcement and feedback (Merriam, 1996). The significance of such theories is amplified in military training, where the stakes of learning and retention are exceptionally high. The transition from pedagogy to andragogy focuses on the unique attributes of adult learners, whose motivations and experiential backgrounds differ markedly from those of younger students (Merriam, 1996). The Navy's RRL initiative acknowledges these adult specificities, leveraging the sailors' prior experiences and intrinsic motivations to foster a learner-centric environment. This approach is aligned with contemporary adult learning theories that emphasize the value of integrating learners' experiences into the educational process. Adapting this model to assess blended-modular learning in RRL indicates the



Navy's commitment to evaluating the impact of training reforms through a well-established evaluation process.

## **B. CURRENT RESEARCH ON MILITARY TRAINING**

Recent military training and education studies have explored the efficacy of virtual and blended learning environments, often called modular learning. Research conducted at the Submarine Learning Center's virtual schoolhouse (VSH) indicates that virtual environments can be as, if not more, effective than traditional face-to-face settings, offering benefits like enhanced work-life balance and unique learning tools. They use a mixed-method approach, dividing students into two groups of 12, one group receiving training in a VSH environment and the other in a traditional setting. Pre- and post-training surveys are completed, as well as post-training interviews. The pre-training survey assessed students' feelings about their regulatory focus and self-regulated learning. It found no significant differences between the virtual and traditional groups, indicating initially similar goal orientations and learning habits. The pre-survey included questions on multimedia efficacy and showed comparable confidence levels in technology use among both groups. Post-training surveys contained questions on learner-instructor interaction, learner-content interaction, cognitive engagement (curiosity, attention focus, and interest), and attitudes (affective and cognitive) (Aten et al., 2014). There was a positive perception of learner-instructor and learner-content interaction in both settings, with the virtual environment excelling in engagement and cognitive involvement. The virtual group displayed notable improvements in attitudes toward learning, suggesting a more enhanced experience in the VSH.

Additionally, post-training interviews were conducted with the trainees to help them understand their experience with the training; these interviews highlighted the advantages of the VSH, like ease of use, convenience, and unique learning tools. Participants appreciated the reduced need for travel and its balance with their personal lives (Aten et al., 2014). However, they also noted the lack of face-to-face interaction as a significant disadvantage. The VSH findings favor the Navy's plan to move forward and



implement additional training modules via virtual schoolhouses post “A” school, which could significantly reduce costs and time spent away from duty (NETC, 2017).

Limitations of this study are its small sample size and particular context to virtual schoolhouses in the submariner world. The study’s reliance on a limited participant group from a single course in one location questions the generalizability of its findings. Additionally, the study’s design, influenced by the imperative to prioritize Sailor education, might not fully capture the broader potential of virtual worlds in diverse educational settings. While the study opens avenues for future research, such as the effectiveness of different virtual world features and learning strategies, its preliminary findings necessitate replication with larger, more varied groups across multiple locations to ensure reliability and applicability. This study acts as a foundational step, highlighting the importance of comprehensive and methodologically robust research to further understand and utilize virtual worlds in Navy training; however, it needs to be improved in follow-up studies.

In another study, Spears (2014) identified factors affecting training effectiveness in synchronous, dispersed virtual environments was focused on identifying factors that influence training effectiveness in online environments, specifically focusing on the Navy’s distance learning needs (Spears, 2014). The study created a theoretical framework to optimize these environments for practical training, considering interaction, technology use, and learning strategies. This includes the Technology Acceptance Model (TAM), which highlights how learning outcomes are influenced by factors like student personality, perceptions of system performance, and the ease of use of these technologies (Spears, 2014). Instructors’ attitudes and technical competencies in these virtual environments are also crucial, impacting the learning experience and outcomes. This aligns with the RRL’s initiative’s focus on just-in-time, learner-centric training while emphasizing the need to enhance training effectiveness through virtual learning environments rather than aiming for cost reduction.

The research on the Army’s Advanced Operations Course (AOC) using Blended Distributed Learning (BDL) was conducted with students who were primarily full-time working officers with families attending AOC in addition to their regular duties. The study



analyzed exit surveys from these students and included a survey of graduates who completed the 2009–2010 AOC curriculum (Straus et al., 2013). The findings showed that while students generally appreciated the BDL format, they faced challenges with computer-supported collaboration and preferred face-to-face interaction for complex subjects. This feedback highlights the need to integrate traditional learning elements into blended models for complex skills training (Straus et al., 2013).

A significant limitation was its focus on students who completed the course, leaving out insights from those who dropped the course or completed it later. Students needed help in computer-supported collaboration, indicating potential gaps in this aspect of the BDL model (Straus et al., 2013). A strong preference for face-to-face interaction for complex subjects suggested limitations in the BDL format’s suitability for all learning types. Issues like technical difficulties and access problems were evident, emphasizing the need for robust technology and effective online collaboration strategies in virtual learning environments. The study recommends enhancing the technological infrastructure to ensure reliable and consistent access, improving the design of online collaboration tools to facilitate more effective group work, and integrating more face-to-face components for the complex subject matter (Straus et al., 2013).

Overall, BDL has several strengths, like meeting core purposes and high ratings in student-instructor interaction, and suggests that course design plays a crucial role in effectiveness. However, regardless of its strengths, it still emphasized the need for continuous evaluation and adaptation to optimize learning outcomes in BDL environments.

### **C. CURRENT TRAINING GAPS**

The Center for Research on Evaluation, Standards, and Student Testing (CRESST) is a leading research center specializing in assessment, evaluation, methodology, and technology to improve learning outcomes at the University of California, Los Angeles (UCLA), tasked by the Navy to analyze the LS and RS implications of RRL in the Fleet. They identified several critical training gaps in the RRL Curriculum and how it has translated to the U.S. Navy Fleet. The reports were done on the Logistic Specialists and Retail Service Specialists Rating, highlighting the need to update and revise the training



content, mainly focusing on tasks with lower graduate competency and training adequacy ratings (CRESST, 2022; CRESST, 2023). A notable discrepancy was observed between graduates' self-assessments and supervisors' evaluation of competencies, indicating potential overestimation of skills by graduates (CRESST, 2023). This discrepancy in self-evaluation versus external evaluation is a well-recognized aspect of performance assessments and learning environments; therefore, it is not surprising here, but it reinforces the need for multiple evaluation methods. Other training adequacy concerns were raised, with specific tasks inadequately covered in the curriculum (CRESST, 2023). The frequency of task performance emerged as a concern, with less frequently performed tasks correlating with lower competency levels (CRESST, 2023).

Additionally, there was a consistent call for more hands-on training and the need to balance the theoretical aspects with practical application (CRESST, 2022; CRESST, 2023). Challenges in distributed learning environments, such as technology reliability and coordination difficulties, were also noted as impediments to achieving course goals (CRESST, 2022).

The analysis conducted in 2017 on Enlisted accession testing offers essential perspectives on the Navy's future talent management, such as the impact and effectiveness of its training programs. There is a gap in the Navy's assessment of teamwork and leadership skills, which are critical for operational efficiency (Riley, 2017). It highlights that the current focus on cognitive testing in the Navy's accession process may not adequately capture the full range of skills and attributes necessary for high-performance teams, especially in the enlisted ranks (Riley, 2017). This insight is particularly relevant in evaluating the effectiveness of training models like RRL, as it underscores the importance of aligning training content with accessions and retention. "A" school is the second phase in all Navy accessions, so it is essential to incorporate effective training into the RRL training model. The study suggests the potential of incorporating personality traits into the selection process, which could lead to more effective team composition and higher retention rates.

The Navy's shift from its legacy training system to the Ready Relevant Learning (RRL) model is a significant change in training strategy, focusing on a blended, modular



approach and more learner-centered methods to meet the changing requirements of today's Sailors. Previous studies highlight the need to understand virtual learning environments in naval training today. Studies on these environments show that students can still learn effectively and efficiently. However, the course must be correctly developed for the learning environment and keep students motivated to be successful.

However, with the identified gaps in current training, especially in assessing competencies and balancing theory with practical skills, as noted in CRESST reports, this study aims to investigate these gaps further, comparing RRL with legacy training to see if training outcomes are influenced more by the training methods or other factors like a change in AFQT scores or demographic changes. Ultimately, this research seeks to provide a broader understanding of RRL's effectiveness, contributing valuable insights to military training and education in all "A" schools.



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## IV. METHODOLOGY

This section discusses the source and content of our data, research limitations, details of the data cleaning, and methodology. This section provides a foundational understanding of data and methods.

### A. DATA

I use data from the Navy’s Corporate Enterprise Training Activity Resource Systems (CeTARS), the U.S. Navy’s primary tool for tracking and reporting training events. CeTARS provided a report on end-of-course GPAs, scaled to 100, for LS, PS, RS, and YN “A” school-rated Sailors. The 2017–2023 dataset also includes curriculum codes, course durations, student age during “A” school, AFQT scores, demographics, marital status, if they passed the course, current Navy status, and recent ranks. Each data point connects with a Department of Defense ID, ensuring every information corresponds to an “A” school Sailor. The total observations within the data set are 10,580 sailors who attended “A” school during that time. The primary dataset, which includes course IDs and GPAs tied to individual sailors from the specified “A” school timeframe, enabled the development of a baseline model. This straightforward linear probability model distinguishes between students in the legacy and RRL courses; using their GPAs as the outcome variable provides a basis for comparing the two programs. Once the base model regression was complete, I could add fixed effects to help control for outlying factors.

Center for Service Support (CSS) provided legacy tests for LS, PS, RS, and YN ratings, and an RRL test bank for RS and PS ratings was retrieved from the United States Fleet Forces share drive; the LS and YN RRL tests were unavailable. The same source provided legacy and RRL curriculum learning objectives. data cleaning

There were roughly 900 duplicate data points because the legacy curriculum for Logistic Specialists had some students going to a follow-on postal course, which is no longer offered nor part of any curriculum. That postal curriculum did not affect the LS legacy “A” school’s overall end-of-course grades. To remove unnecessary personnel, the



postal course was dropped. After data cleaning and accounting for the Postal students and the students in the pilot courses, the total number of observations was 9,951.

Outliers are the students who took the pilot course for each curriculum. Pilot courses are the first iteration and trial of the new training and still need to be fully implemented, resulting in many errors being worked out before the course is officially implemented. The pilot course students have the lowest GPA overall, and there is a large gap between the pilot course and the actual implementation date of the rates of the new RRL curriculum. For this reason, these students were dropped from the dataset to avoid influencing the GPA for RRL curriculums because it still needed to be finalized and officially implemented by the Navy. This will allow for a more accurate reflection within RRL GPAs.

## **B. DESCRIPTIVE DATA**

The variables used in the data were demographics, broken out in Table 1, GPA; broken out in Table 2 by rate training, RRL, or legacy Curriculum; and Table 3, AFQT score, broken out by RRL, legacy, and demographics, to include the standard deviations, mean, minimum, maximum, and number of observations in each subset. Figure 4 depicts the decrease of AFQT scores, while Figure 5 illustrates the demographic shift and increase in African American population in the RRL curriculum. The variable descriptions follow:

- **Race/Ethnicity:** This categorical variable identifies the sailor's self-reported racial or ethnic background. It includes the following categories: American Indian/Alaska Native, Asian, African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, Other, and White.
- **Number:** A numerical variable representing the count of sailors within each racial/ethnic category or gender group.
- **Percent:** This variable indicates the percentage of sailors within each racial/ethnic category or gender group relative to the total number of sailors in the sample.



- **Gender:** A binary categorical variable representing the sailor's gender, with categories for total females and males in the RRL and legacy training groups.
- **Total Enrolled in RRL:** A numerical variable indicating the total number of sailors enrolled in the Ready Relevant Learning (RRL) program, detailed by race/ethnicity.
- **Total Enrolled in Legacy:** A numerical variable representing the total number of sailors enrolled in the training program, detailed by race/ethnicity.



Table 1. Demographic Sample Statistics

<b>Race/Ethnicity of Sailors</b>	<b>Number of Observations</b>	<b>Percent of Sample</b>
<b>Native American/Alaskan Native</b>	87.0	7
<b>Asian</b>	1,195.0	12.01
<b>African American</b>	3,743.0	37.61
<b>Hispanic Or Latino</b>	1,293.0	12.99
<b>Native Hawaiian or Pacific Islander</b>	147.0	1.48
<b>Other</b>	250.0	2.51
<b>White</b>	3,236.0	32.52
<b>Total</b>	9,951.0	100
<b>Gender</b>	<b>Number of Observations</b>	<b>Percent of Sample</b>
<b>Total Females in RRL</b>	1,372	43.83
<b>Total Females in Legacy</b>	3,767	37.86
<b>Total Males in RRL</b>	1,758	56.17
<b>Total Males in Legacy training</b>	6,184	62.14
<b>Total</b>	9,951	100
<b>Race/Ethnicity of Sailors in Legacy</b>	<b>Number of Observations</b>	<b>Percent of Sample</b>
<b>Native American/Alaskan Native</b>	68	1
<b>Asian</b>	764	11.20
<b>African American</b>	2,377	34.85
<b>Hispanic Or Latino</b>	942	13.81
<b>Native Hawaiian or Pacific Islander</b>	98	1.44
<b>Other</b>	246	3.61
<b>White</b>	2,326	34.10
<b>Total Sailors in Legacy</b>	6,821	100
<b>Race/Ethnicity of Sailors in RRL</b>	<b>Number of Observations</b>	<b>Percent of Sample</b>
<b>Native American/Alaskan Native</b>	19	0.61
<b>Asian</b>	431	13.77
<b>African American</b>	1,366	43.64
<b>Hispanic Or Latino</b>	351	11.21
<b>Native Hawaiian or Pacific Islander</b>	49	1.57
<b>Other</b>	4	0.13
<b>White</b>	910	29.07
<b>Total Sailors in RRL</b>	3,130	100



Table 2. GPA Summary Statistics

Variable <sup>1</sup>	Number of Observations <sup>2,3</sup>	Mean Score <sup>2,3</sup>	Standard Deviation <sup>3</sup>	Minimum Score <sup>4</sup>	Maximum Score <sup>4</sup>
Legacy GPA	6,821	85.09	6.80	64.17	100
RRL GPA	3,130	84.39	7.28	70	100
LS Legacy GPA	3,630	85.87	6.66	70	100
LS RRL GPA	892	82.08	7.49	70	100
PS Legacy GPA	871	83.81	6.39	70	99.38
PS RRL GPA	610	86.14	6.51	70	99.14
RS Legacy GPA	594	86.66	5.93	71.25	99.29
RS RRL GPA	777	86.35	6.47	70	100
YN Legacy GPA	1,726	83.58	7.19	64.17	100
YN RRL GPA	851	83.81	7.47	70	100
<b>GPA by Demographic</b>					
Female GPA	3,767	86.03	6.96	70	100
Male GPA	6,184	84.17	6.87	64.17	100
Married GPA	638	87.48	7.11	64.17	100
Non-married Sailor GPA	9,313	84.70	6.91	70	100
Married Female GPA	313	89.14	6.45	71.2	100
Native American/Alaska Native GPA	87	84.52	7.36	71.2	100
Asian GPA	1,195	85.98	7.23	20	100
African American GPA	3,743	84.91	7.02	70	100
Hispanic/Latino GPA	1,293	84.32	6.75	64.17	100
Hawaiian or Pacific Islander GPA	147	84.79	6.91	70.29	97.5
Other GPA	250	85.17	6.21	70	90.33
White GPA	3,236	84.66	6.88	70	100

<sup>1</sup>Variable: This categorical variable identifies the specific group or category for which the GPA data is reported.

<sup>2</sup>Number of observations and Mean score: Number of observations: The total count of observations for each category. Mean score: Average GPA score for each category, providing a central measure of academic performance.

<sup>3</sup>Number of observations, Mean score, and Standard Deviation: Measuring the variability or dispersion of GPA scores around the mean for each category. It indicates how spread out the scores are.

<sup>4</sup>Minimum and Maximum Score: Indicating the lowest and highest GPA score recorded within each category, highlighting the range of academic performance.



Table 3. AFQT Summary Statistics

Variable <sup>1</sup>	Number of Observations <sup>2</sup>	Mean Score <sup>2</sup>	Standard Deviation <sup>3</sup>	Minimum Score <sup>4</sup>	Maximum Score <sup>4</sup>
Legacy AFQT Score	6,821	55.54	15.27	0	99
RRL AFQT Score	3,130	46.66	16.50	10	99
LS Legacy AFQT	3,630	56.36	14.72	0	99
LS RRL AFQT	892	49.13	15.21	22	99
PS Legacy AFQT	871	58.86	15.64	0	99
PS RRL AFQT	610	50.89	16.66	10	99
RS Legacy AFQT	594	46.17	11.98	31	98
RS RRL AFQT	777	40.67	14.23	11	97
YN Legacy AFQT	1,726	55.35	15.98	0	99
YN RRL AFQT	851	46.50	15.54	10	99
Female AFQT	3,767	48.91	14.13	0	99
Male AFQT	6,184	55.08	16.92	0	99
Married AFQT	638	50.34	17.30	12	99
Non-married Sailor AFQT	9,313	52.91	16.10	0	99
Married Female AFQT	313	48.55	16.22	12	99
Native American/Alaska Native AFQT	87	51.87	15.65	0	97
Asian AFQT	1,195	54.67	18.06	10	99
African American AFQT	3,743	48.44	13.86	0	99
Hispanic/Latino AFQT	1,293	52.18	14.76	13	98
Hawaiian or Pacific Islander AFQT	147	51.25	15.05	18	97
Other AFQT	250	57.71	14.96	0	98
White AFQT	3,236	3,236	17.34	0	99

<sup>1</sup>Variable: Identifies the specific group and training programs for which the AFQT, demographic groups, and ratings

<sup>2</sup>Number of observations and Mean score: Number of observations: The total count of individuals within each category for whom AFQT scores were recorded. Mean score: Armed Forces Qualification Test (AFQT) score for each group, indicating the general level of aptitude within the group

<sup>3</sup>Standard Deviation: Measures the variability of AFQT scores around the mean within each group, indicating the diversity in aptitude levels.

<sup>4</sup>Minimum and Maximum Score: The lowest and highest AFQT score recorded within each group, showing the range of aptitude levels present.



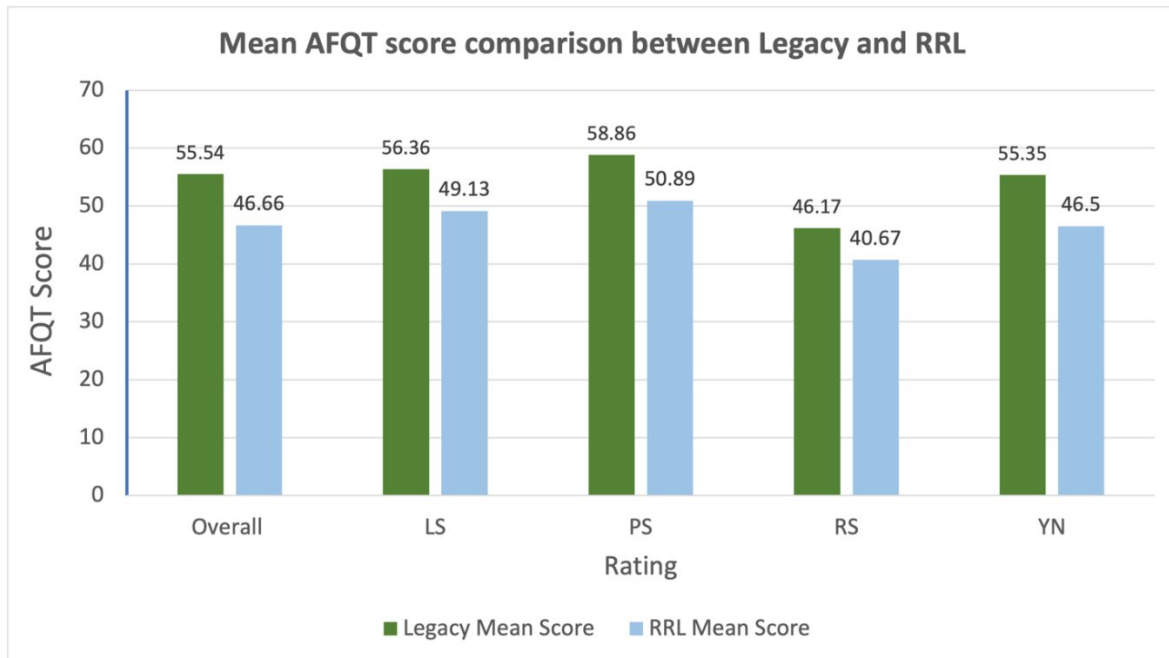


Figure 4. Mean AFQT Score Comparison between Legacy and RRL Curriculums. Data source: (CSS, 2023)

These data statistics are essential to understanding the analysis because of the number of female and African American sailors. Female sailors increased from 37.86% to 43.83% of the total sample size. Forty-four percent of women is more than double the Navy's reported 20.7% of all enlisted forces being female (DOD, 2022). This could be because females are more interested in administrative and supply ratings than mechanical or combat-related ratings. The importance of these numbers is seen in the results section.

Figure 4 highlights the notable difference in AFQT scores between legacy and RRL students, where RRL scores decrease by roughly 8 points across the curriculums. However, there is a significant increase in African American representation within the RRL training program, as seen in Figure 5, which may also have implications on the overall end-of-test scores. This demographic shift could suggest a positive correlation between the minimal impact of lower AFQT scores and RRL's end-of-test scores. This percent increase in this demographic is also notable because, according to a Navy demographics report, only 37% of Navy Sailors report being a minority (DOD, 2022). The increase in African American participation in RRL training, beyond reflecting Navy diversity goals, suggests that



demographic factors may contribute to the stability of test scores despite variances in AFQT scores.

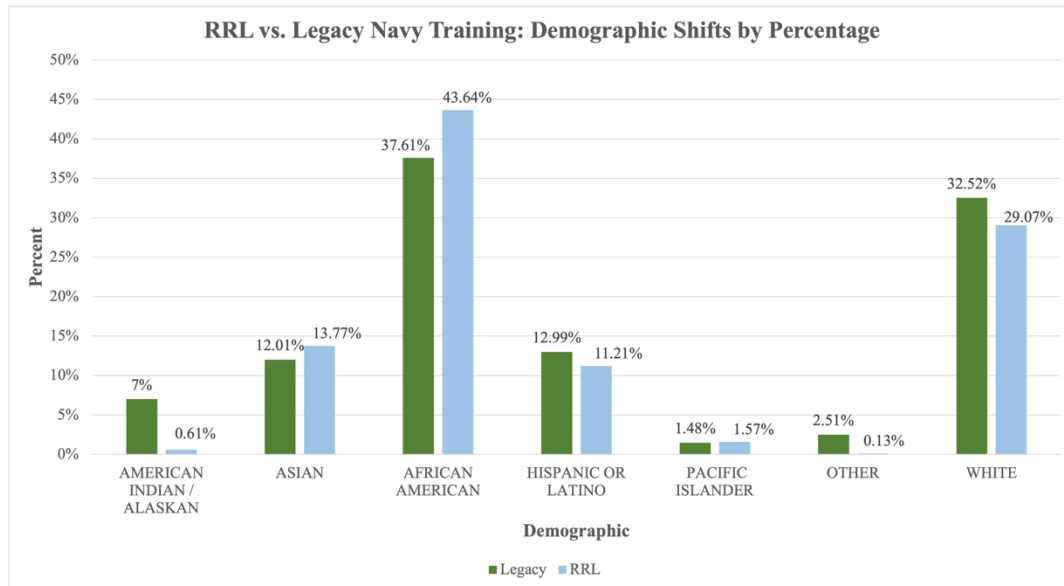


Figure 5. RRL vs. Legacy Navy Training: Demographic Shifts by Percentage. Data Source: (CSS, 2023)

### C. LIMITATIONS

While the data obtained was comprehensive, there were a few limitations. First, when comparing programs like the RRL and legacy, there are expected discrepancies in assessment methods. Variances in grading rubrics, the complexity of exams, and differing instructor evaluations can lead to consistency in GPA scores. These inconsistencies only sometimes reflect the actual effectiveness of the training program. For instance, inherent variabilities, such as batch-to-batch grading differences or the personal grading tendencies of individual instructors, can further muddle the GPA's clarity. A test comparison offers insight into the similarities and differences in tests. Additionally, comparing each curriculum's learning objectives helps account for differences.

Second, the data for instructors' students was unavailable. Instructors cause variability between GPAs; a new instructor could yield a lower GPA for a student than one who had a seasoned instructor who has taught longer and is more familiar with the





curriculum because the instructor information was unavailable, which cannot be accurately accounted for in GPA outcomes.

Last, relying on Grade Point Average (GPA) as the principal metric in this study presents several limitations. Primarily, while quantitative, GPA offers a more constricted lens to view a student's academic performance. It does not necessarily capture the broader aspects of learning, including practical application, job performance, or learning retention.

A high GPA, while indicative of academic success, may only sometimes represent long-term knowledge retention or the capability to apply acquired knowledge in practical scenarios. This distinction is particularly relevant in military contexts, where the application and long-term recall of knowledge are often more vital than immediate academic success. Over time, course improvements might yield enhancements in performance, leading to potential grade inflation without actual improvements in learning or proficiency.

#### **D. METHODS**

A regression-based, event-study analysis was chosen for this research, given the extensive data, numerous observations, and several control variables pertinent to predicted Sailor performance. Prior studies on the RRL program were limited, primarily qualitative, and focused on VSH and surveys from other rates implementing RRL or similar training programs across services (Aten, 2014; Straus, 2013; Tick, 2020). Additionally, CRESST conducted Fleet surveys on the performance of Sailors who underwent RRL training in both LS and RS ratings (CRESST, 2022, 2023). The CRESST study helps link the results of the schoolhouse to on-the-job training (OJT) in the Fleet; it does not directly assess the impact of the curriculum on student outcomes and is limited in scope with only 67 observations.

To compare learning objectives, I analyzed the course instruction and learning objectives provided by CSS and noted the differences. Adobe Acrobat's compare tool facilitated an in-depth text analysis comparison of learning objectives by highlighting changes between the original and updated texts. The analysis indicated minimal



modifications, primarily in phrasing and wording, while most objectives and delivery methods remained consistent.

Due to test availability, the test comparison is limited to the RS and PS ratings. This was done by taking the provided legacy and creating RS and PS tests from the RRL test bank to mirror the current testing format provided by the schoolhouse. The significant difference is not a change in test questions, which remained similar or slightly modified, but the test structure. For instance, the RS legacy curriculum had four tests that ranged from 15 to 35 questions dependent on weekly learning objectives with no final. In comparison, the RRL curriculum had four 20-question tests, and the fifth test was a final that consisted of 50 questions.



## V. DISCUSSION OF RESULTS

### A. INTRODUCTION

Below are the findings, beginning with an overview of the data and initial findings from raw data, leading to a regression analysis.

### B. DESCRIPTIVE TABLES

Comparing the legacy and RRL curriculums, it is essential to consider that differences may extend beyond the instructional model. Examining test questions and learning objectives suggests a consistency in their structure; they exhibit slight variation in phrasing and target outcomes, potentially skewing a direct comparison since these elements remain primarily unchanged across different courses, theoretically maintaining a steady end-of-course score profile.

However, data from Table 4, column (3), indicates a statistically significant decrease of 0.70 percentage points (pp) in final test scores when transitioning from the legacy to the RRL curriculum. This statistical significance does not immediately translate to economic or educational significance; a 0.70pp difference could be considered marginal in a high-performing context, such as a decline from 98.0 to 97.3, which typically would not affect a student's overall standing. Nevertheless, the impact of this difference becomes critically significant at the thresholds of grade determination, specifically between scores of 69.3 and 70.0, where it may mean the difference between passing and failing.

The analysis presented in Table 4, column (3), reveals a marked decline in AFQT scores among participants transitioning from the legacy to the RRL curriculum, with a substantive 8.88pp decrease. This statistically significant result would signal potential impacts on broader academic performance measures, such as overall GPA. Given the magnitude of the decline in AFQT scores, a concurrent drop in GPA might be anticipated to exceed the 0.70pp observed. However, after adjusting for demographic variations, the expected substantial decrease in GPA does not manifest, indicating that factors beyond AFQT performance may mediate academic outcomes within the RRL curriculum.



The RRL group’s demographic profile is notably diverse, increasing by 9pp in female and African American representation and by 7pp in married individuals. This demographic evolution is complemented by a 3pp uptick in Asian Sailors, counterbalanced by a 5pp decline in White Sailors, and a 3pp diminution in Hispanic Sailors. Such shifts underscore the significant demographic distinctions between the two curriculums and suggest an interplay between demographic characteristics and academic achievements that warrants further investigation.

The noted demographic shift is seen in Table 4, and the following regression tables, each broken out by rate, is the increase in females, married, and African American sailors, where each demographic does notably better on RRL than others. This demographic shift is significant to note for its impact on RRL’s success because even with low AFQT scores, the reflection.

Table 4. Legacy and RRL Sample Mean Differences

	(1)	(2)	(3)
	Legacy	RRL	Difference in (RRL)-(Legacy)
Final Course Score	85.10 (6.80)	84.40 (7.28)	-0.70*** (0.15)
AFQT Score	55.54 (15.27)	46.66 (16.50)	-8.88*** (0.35)
Age in 'A' school	22.40 (4.70)	22.72 (5.08)	0.33*** (0.11)
Female Sailors	0.35 (0.48)	0.44 (0.50)	0.09*** (0.01)
Married	0.04 (0.20)	0.12 (0.32)	0.07*** (0.01)
African American Sailors	0.35 (0.48)	0.44 (0.50)	0.09*** (0.01)
Hispanic Sailors	0.14 (0.35)	0.11 (0.32)	-0.03*** (0.01)
AmericanIndian	0.01 (0.10)	0.01 (0.08)	0.00** (0.00)
Asian	0.11 (0.32)	0.14 (0.34)	0.03*** (0.01)
Hawaiian_Islander	0.01 (0.12)	0.02 (0.12)	-0.00 (0.00)
other	0.04 (0.19)	0.00 (0.04)	-0.03*** (0.00)
white	0.34 (0.47)	0.29 (0.45)	-0.05*** (0.01)
Observations	6821	3130	9951

Columns (1) and (2) are the means, with SD in parentheses. Column (3) is the difference in means, with the SE of the difference in parentheses and with stars specifying significance as follows: \* for p<.10, \*\* for p<.05, \*\*\* for p<.01.



## C. INITIAL RESULTS

In 2020, the Navy began implementing RRL, initiating with the RS rating in 2020 and advancing to the PS and YN ratings in 2021, culminating with the LS rating in 2022. An initial decline in performance was observed across the board as each rate switched. However, this trend appeared to reverse over time with the introduction of demographic controls. Notably, female, African American, and married Sailors displayed a strong positive correlation with GPA. This correlation, as seen in Table 4, suggests that despite encountering lower AFQT scores, these specific demographic groups contributed to sustaining higher RRL end-of-test scores, mitigating the negative impacts initially observed within the educational institutions.

Table 5 delineates the effects of the RRL training when demographic factors and AFQT scores are considered. It presents a marginal underperformance of 0.049pp in RRL compared to legacy training; it does not significantly influence curriculum outcomes. Notably, the table highlights the positive correlations between final course scores and specific demographics—namely, female, married, and African American Sailors.

The differences in performance between the legacy and RRL curriculums among these demographic groups are seen in Table 4. Subsequently, Table 5 underscores their enhanced success within the RRL curriculum. Adjusting for demographics elucidates an improvement in final course scores, though such improvement does not reach statistical significance about the Final Course scores. Nonetheless, the influence of these demographic factors is apparent: female Sailors improved by 2.5pp after a 9pp increase in representation within the “A” school; African American Sailors saw a 0.5pp increase alongside a 9pp rise in representation; and married Sailors experienced a 1.3pp increase following a 7pp increase in representation.

For a more in-depth understanding, the columns in Tables 5 through 9 are segmented to display incremental controls: Column 1 presents scores without any controls; Column 2 adds in AFQT scores; Column 3 incorporates both AFQT scores and age; Column 4 includes AFQT scores, age, and the female demographic; Column 5 further adds marital status into the mix; and Column 6 encompasses AFQT scores, age, female



demographic, marital status, and additional demographic variables. This progression through the columns illustrates how each additional control refines our understanding of the RRL curriculum’s impact on final course scores. Based on this model is how results were analyzed:

$$GPA(\text{Rate}) = \beta_0 + \beta_1(\text{Rate Policy Change}) + \beta_2(\text{AFQT}) + \beta_3(\text{Age}) + \beta_4(\text{Gender}) + \beta_5(\text{Married}) + \beta_6(\text{African American}) + \beta_7(\text{hispanic}) + \epsilon$$

Table 5. Sailors’ Demographic Characteristics and RRL Final Course Scores

	(1)	(2)	(3)	(4)	(5)	(6)
	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score
RRL Course	-0.698*** (0.150)	0.297* (0.150)	0.153 (0.148)	0.051 (0.146)	-0.028 (0.147)	-0.049 (0.147)
AFQT Score		0.112*** (0.004)	0.105*** (0.004)	0.118*** (0.004)	0.119*** (0.004)	0.122*** (0.004)
Age in 'A' school			0.236*** (0.014)	0.231*** (0.014)	0.207*** (0.015)	0.203*** (0.015)
Female Sailors				2.569*** (0.137)	2.541*** (0.137)	2.518*** (0.137)
Married					1.285*** (0.290)	1.295*** (0.290)
African American Sailors						0.479*** (0.145)
Hispanic Sailors						-0.240 (0.204)
Constant	85.098*** (0.084)	78.878*** (0.253)	74.008*** (0.379)	72.463*** (0.382)	72.920*** (0.395)	72.741*** (0.407)
Observations	9951	9951	9951	9951	9951	9951
R <sup>2</sup>	0.002	0.066	0.092	0.123	0.125	0.126

Standard errors in parentheses  
\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Data Source: CSS, 2023

The LS RRL course based on Table 6 shows a notable 3.3pp decrease in scores compared to the legacy course, even after adjusting for a demographic shift with more female, African American, and married Sailors. Despite this overall underperformance, it is critical to highlight that these specific demographic groups fare better in the RRL course. This divergence suggests that while the RRL curriculum may not universally outperform



the legacy system, it offers advantages for these subgroups, meriting further investigation into how educational content and delivery can be tailored to diverse learning needs. However, it is essential to note that the LS course is the newest RRL course in the supply schoolhouse, being implemented for only a year, so it is possible that once the curriculum is in place for longer and more students go through it, the gap between RRL and legacy will become smaller.

Table 6. Sailors’ Demographic Characteristics and LS RRL Final Course Scores

	(1)	(2)	(3)	(4)	(5)	(6)
	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score
LS RRL Course	-3.794 <sup>***</sup> (0.255)	-2.976 <sup>***</sup> (0.252)	-3.060 <sup>***</sup> (0.246)	-3.132 <sup>***</sup> (0.240)	-3.186 <sup>***</sup> (0.240)	-3.303 <sup>***</sup> (0.241)
AFQT Score		0.113 <sup>***</sup> (0.007)	0.108 <sup>***</sup> (0.006)	0.122 <sup>***</sup> (0.006)	0.126 <sup>***</sup> (0.006)	0.127 <sup>***</sup> (0.006)
Age in 'A' school			0.291 <sup>***</sup> (0.019)	0.291 <sup>***</sup> (0.019)	0.282 <sup>***</sup> (0.019)	0.248 <sup>***</sup> (0.020)
Female Sailors				2.894 <sup>***</sup> (0.198)	2.841 <sup>***</sup> (0.198)	2.809 <sup>***</sup> (0.198)
African American Sailors					0.859 <sup>***</sup> (0.209)	0.858 <sup>***</sup> (0.209)
Hispanic Sailors					-0.351 (0.294)	-0.342 (0.293)
Married						1.844 <sup>***</sup> (0.406)
Constant	85.873 <sup>***</sup> (0.113)	79.494 <sup>***</sup> (0.390)	73.222 <sup>***</sup> (0.562)	71.374 <sup>***</sup> (0.564)	71.148 <sup>***</sup> (0.577)	71.766 <sup>***</sup> (0.591)
Observations	4522	4522	4522	4522	4522	4522
R <sup>2</sup>	0.047	0.104	0.147	0.186	0.190	0.194

Standard errors in parentheses  
 \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Data Source: CSS, 2023

While Table 6 marks a significant decrease in GPA overall, the other ratings seen in Tables 7 through 9, when accounting for demographics and low AFQT, yield higher GPAs overall, ranging from 0.23pp to 2.79pp higher than the legacy curriculums. Again, these are statistically significant, but they are not educationally significant. These small increases signify that even though we would expect lower academic performance, we are



yielding the same results and that some other factor about the demographic shift is causing the final course score to remain unchanged.

Table 7. Sailors’ Demographic Characteristics and PS RRL Final Course Scores

	(1)	(2)	(3)	(4)	(5)	(6)
	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score
PS RRL Course	2.330 <sup>***</sup> (0.340)	3.280 <sup>***</sup> (0.332)	3.036 <sup>***</sup> (0.322)	2.845 <sup>***</sup> (0.319)	2.842 <sup>***</sup> (0.319)	2.796 <sup>***</sup> (0.327)
AFQT Score		0.119 <sup>***</sup> (0.009)	0.109 <sup>***</sup> (0.009)	0.120 <sup>***</sup> (0.009)	0.120 <sup>***</sup> (0.009)	0.120 <sup>***</sup> (0.009)
Age in 'A' school			0.273 <sup>***</sup> (0.028)	0.265 <sup>***</sup> (0.028)	0.265 <sup>***</sup> (0.028)	0.258 <sup>***</sup> (0.029)
Female Sailors				2.173 <sup>***</sup> (0.317)	2.173 <sup>***</sup> (0.318)	2.158 <sup>***</sup> (0.319)
African American Sailors					0.004 (0.341)	0.006 (0.341)
Hispanic Sailors					-0.101 (0.470)	-0.093 (0.471)
Married						0.387 (0.589)
Constant	83.808 <sup>***</sup> (0.218)	76.797 <sup>***</sup> (0.590)	71.063 <sup>***</sup> (0.820)	69.827 <sup>***</sup> (0.828)	69.846 <sup>***</sup> (0.858)	69.989 <sup>***</sup> (0.885)
Observations	1481	1481	1481	1481	1481	1481
R <sup>2</sup>	0.031	0.126	0.179	0.204	0.204	0.204

Standard errors in parentheses

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Data Source: CSS, 2023

Initially, the PS RRL Course shows a significant increase of 2.33 percentage points (pp) over the legacy course (p<0.01). This trend persists, although slightly diminished, through subsequent models with the introduction of controls for AFQT scores, age, and demographics. The AFQT score is positively correlated with course performance, indicating its predictive value for success in the curriculum. Age also shows a significant positive relationship with final scores, suggesting that maturity or experience may affect academic achievement.

In the PS course, female Sailors have a significant positive impact on final course scores, with an increase of over 2pp, which underscores the importance of gender as a factor in educational attainment within the Navy’s training programs. However, no statistically significant effect is observed for African American Sailors when controlling





for other factors, which aligns with the other courses. This is surprising given that their demographic shift is so large and significant in Table 7, but the positive correlation still aligns with their impact on the demographic change. Marital status also positively correlates with final scores, though this does not significantly impact the final model. The constant across all models remains significant, affirming the robustness of the course’s foundational scoring metric.

Table 8. Sailors’ Demographic Characteristics and RS RRL Final Course Scores

	(1)	(2)	(3)	(4)	(5)	(6)
	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score
RS RRL Course	-0.313 (0.340)	0.372 (0.335)	0.294 (0.338)	0.402 (0.329)	0.401 (0.328)	0.273 (0.332)
AFQT Score		0.124*** (0.012)	0.123*** (0.012)	0.141*** (0.012)	0.146*** (0.012)	0.148*** (0.012)
Age in 'A' school			0.066 (0.039)	0.060 (0.038)	0.051 (0.038)	0.014 (0.041)
Female Sailors				2.955*** (0.332)	2.924*** (0.332)	2.852*** (0.333)
African American Sailors					0.891** (0.342)	0.885** (0.341)
Hispanic Sailors					-0.413 (0.528)	-0.398 (0.527)
Married						1.707* (0.739)
Constant	86.664*** (0.256)	80.921*** (0.616)	79.594*** (0.994)	77.805*** (0.987)	77.406*** (1.016)	78.140*** (1.062)
Observations	1371	1371	1371	1371	1371	1371
R <sup>2</sup>	0.001	0.071	0.073	0.124	0.130	0.133

Standard errors in parentheses  
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Data Source: CSS, 2023

Table 8 quantifies the impact of various factors on final course scores on the RS RRL course. The RRL course initially indicates a slight underperformance compared to the legacy course, with a decrease of 0.313 percentage points. Although this is not statistically significant, it is also like what is seen in the LS course. As additional controls are included in the model, the AFQT score consistently shows a statistically significant positive correlation with course outcomes, reinforcing its role as a critical predictor of success.



Notably, the presence of female Sailors contributes positively and significantly to final course scores, a trend that strengthens with the inclusion of further demographic controls. African American Sailors also show a positive and significant association with course scores in more controlled models, suggesting that the RS RRL curriculum may be particularly conducive to their academic success. Conversely, Hispanic Sailors do not significantly impact final scores within this model, indicating that the RRL curriculum's effect is like the legacy curriculum for this group.

Marital status presents a strong correlation and positive influence in the fully controlled model, suggesting that either outlying factors drive married Sailors to do better or potential benefits of the RRL curriculum for married individuals.

Table 9. Sailors' Demographic Characteristics and YN RRL Final Course Scores

	(1)	(2)	(3)	(4)	(5)	(6)
	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score	Final Course Score
YN RRL Course	0.224 (0.305)	1.535 <sup>***</sup> (0.298)	1.414 <sup>***</sup> (0.297)	1.183 <sup>***</sup> (0.294)	1.191 <sup>***</sup> (0.294)	1.176 <sup>***</sup> (0.295)
AFQT Score		0.148 <sup>***</sup> (0.008)	0.143 <sup>***</sup> (0.008)	0.160 <sup>***</sup> (0.009)	0.159 <sup>***</sup> (0.009)	0.160 <sup>***</sup> (0.009)
Age in 'A' school			0.162 <sup>***</sup> (0.033)	0.149 <sup>***</sup> (0.032)	0.150 <sup>***</sup> (0.032)	0.142 <sup>***</sup> (0.034)
Female Sailors				2.567 <sup>***</sup> (0.282)	2.570 <sup>***</sup> (0.282)	2.566 <sup>***</sup> (0.282)
African American Sailors					-0.141 (0.300)	-0.133 (0.300)
Hispanic Sailors					0.211 (0.406)	0.203 (0.406)
Married						0.492 (0.678)
Constant	83.581 <sup>***</sup> (0.175)	75.386 <sup>***</sup> (0.493)	72.154 <sup>***</sup> (0.821)	70.570 <sup>***</sup> (0.826)	70.614 <sup>***</sup> (0.859)	70.762 <sup>***</sup> (0.883)
Observations	2577	2577	2577	2577	2577	2577
R <sup>2</sup>	0.000	0.108	0.116	0.144	0.144	0.144

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Data Source: CSS, 2023

Table 9 shows the YN course scores, which exhibit a positive increase, with Column 6 showing a significant improvement of 1.176pp. This increase suggests a more



favorable outcome for the YN RRL over legacy, potentially indicating the curriculum's efficacy.

AFQT scores maintain a positive and highly significant relationship with course performance across all models, affirming their predictive validity. Age is also a significant positive contributor, indicating that older individuals in 'A' school might have an advantage, possibly due to more life experience or prior education. Female sailors consistently and significantly impact scores positively, indicating that the RRL curriculum might be particularly effective for this group. Meanwhile, African American Sailors display a slight difference, suggesting that the RRL's influence is neutral for this demographic.

Marital status still has a positive correlation to success. However, it is not statistically significant in the YN curriculum. It is interesting because it is significant in the original regression and two of four curriculums and indicates that RRL benefits married sailors.



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## VI. CONCLUSION AND RECOMMENDATIONS

This research assesses the Navy's shift from legacy training to Ready Relevant Learning (RRL), focusing on GPA outcomes in varying sailor demographics and AFQT scores. The results support RRL's initial effectiveness, equalizing training standards while accommodating a more diverse population with lower initial AFQT scores, who perform comparably or better under the new curriculum.

### A. RESEARCH QUESTION

- (1) How does the blended module training Ready Relevant Learning (RRL) model compare with the legacy model regarding end-of-course training scores?

In comparing the Ready Relevant Learning model to the legacy training approach, end-of-course scores remained consistent across all Navy ratings. Despite implementing more blended-modular training, the core learning objectives and testing content remained similar, enabling a comparable comparison. Although a statistically significant decline in final scores was observed under the 5% threshold, this did not significantly impact academic outcomes. The minor decrease in scores suggests that while the format of RRL assessments presents new challenges, in this study, that is insignificant. This consistency highlights the RRL model's capability to meet training objectives, even as it accommodates sailors with a broader range of entry-level AFQT scores.

- (2) How does this comparison differ by Sailor AFQT score, age, and demographics? Can these characteristics be predictors of the training model's success?

After controlling for demographics and AFQT scores, the analysis highlights that demographic shifts significantly impact end-of-course training scores, with females, African Americans, and married sailors improving performance. This suggests that AFQT scores and specific demographic factors predict success in the RRL training model, challenging traditional assumptions that lower AFQT scores automatically lead to poorer test outcomes. Despite lower AFQT scores, these demographic groups outperformed expectations, suggesting unobserved factors such as determination or unique skill sets may



play a role in mitigating any potential adverse effects of RRL on end-of-course training scores.

## **B. FUTURE AREAS OF RESEARCH**

Future research should focus on a comprehensive curriculum review, and psychometric analysis of test questions is recommended to further understand the effectiveness of RRL versus legacy training. Investigating Fleet impacts, such as those documented in CRESST reports—focusing on metrics like advancement rates and Sailor Evaluations for RRL and legacy participants—will provide deeper insights into the long-term effects of these training programs. Additionally, maintaining comprehensive datasets on test scores, instructor profiles, educational backgrounds, and ASVAB scores and making the data available for research within Navy Education Pipelines. Beyond the “A” school analysis, exploring other RRL training pillars, as seen in Figure 1, is vital to ensure the RRL training fully addresses the Navy’s needs. Examining the demographic shifts is crucial to ensure the RRL program effectively meets the evolving needs of the Navy’s diversifying student population. This will enable the adaptation of training methodologies and content to align with today’s Sailors’ varied backgrounds and learning styles. Understanding these demographic changes is critical to tailoring RRL’s approach, ensuring it remains relevant to the Sailors and meets the needs of the Fleet.

This is important to Navy training because it re-enforces the need for Navy “A” schools while evaluating the newest method of Navy training in four ratings. While this does not measure the Fleet impact, the initial training is imperative to future success within the Navy. Success within the “A” school translates to successful Sailors in the Fleet; the better and more accurately we can align initial training to the needs of the Navy while cutting time in training, the stronger and more prepared they will be. The Navy’s most important asset is its Sailors, and as we advance in technology, it is our job to get them the best and most accurate training to succeed in their jobs and keep a strong fighting force. It is vital to keep evaluating new RRL curriculums in “A” schools to ensure Sailors are receiving quality rate training.



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