

AN ABSTRACT OF THE THESIS OF

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Title: Training Law Enforcement for Marine Resource Management: A Case Study Analysis of Retention and Perception Impacts From an e-Learning Platform

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Flaxen Conway

As societies we face many environmental issues that need to be addressed through sound management. Whether in the terrestrial or marine environment, effective management techniques from natural resource management (NRM) agencies must be used continually to address these issues. Law enforcement has been used as one approach and an extension of NRM management in the past. Furthermore, training these law enforcement officers is essential to execution of their duties and NRM at large. This study looks at the training and development of the Oregon State Marine Board's (OSMB) law enforcement division. The OSMB experimented with an e-Learning platform to train marine deputies at their annual training academy. This study seeks to explore the ways that e-Learning contributed to impacts of the OSMBs hybrid training program. Results showed that no significant differences in overall test performance were found. There were significant differences, however, when looking at questions on a topic-by-topic basis. Beyond test performance, interviews of officers and other training facilitators identified perceptions of e-Learning impacts that could be considered as key elements of training for marine deputies in the state of Oregon. Results will ultimately help inform the OSMB, instructors, and future marine deputies as to the best practices related to training law enforcement for the marine environment. Well-trained officers can better work towards addressing the concerns that NRM agencies face.

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Training Law Enforcement for Marine Resource Management: A Case Study Analysis of
Retention and Perception Impacts From an e-Learning Platform

by
Peter Morrow

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Major Professor, representing Marine Resource Management

Dean of the College of Earth, Ocean, and Atmospheric Sciences

Dean of the Graduate School

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Peter Morrow, Author

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Chapter 1: Introduction

Today's news headlines warn of numerous natural resource issues, including melting ice caps, ocean acidification, extreme weather events, rising sea levels, depleting fish stocks, and a host of other marine environmental challenges (Griggs, 2018, Harvey, 2018 a, 2018 b, Mooney and Dennis, 2018, Thompson, 2018). While many of these issues were recognized decades ago, they have recently become matters of more pressing importance, particularly as global populations continue to increase and pressures on coastal communities and fisheries continue to expand (Safina, 1994, Peltier and Tushingham, 1989). Some of the natural resource problems faced by societies are natural in origin (i.e. droughts and other extreme weather events), while others are more anthropogenic in nature.

Humans have inhabited the earth for a long time. However, in a geologic sense and since the inception of multicellular organisms on this planet, the presence of *Homo sapiens* has been rather recent. Since the time our ancestors dispersed throughout the world, humanity has made notable discoveries and creations leading to development and collective improvement, both as individuals and as societies. Of particular interest is our historical ability not only to create tools, but also to use these tools for manipulating the natural world around us. Through the creation of these tools, such as hunting equipment and agricultural practices, humanity has positioned itself to acquire many of the benefits the natural world can provide.

From the time the Nile river was initially developed for agricultural practices in ancient Egypt to the current high-tech industry of offshore oil drilling, humans have been exploiting natural resources (Hughes, 1992; Rose, 2009). From mountain ranges to the atmosphere and from rivers to oceans, all corners of the world provide natural resources for all living things. Human-derived benefits from these resources have manifested in different ways from the promise of lucrative industry as seen in the Dungeness Crab fisheries in the Pacific Northwest, to the aesthetic appeal of the National Park System providing the public with iconic vistas. However, the state of these natural resources that humans benefit from would perhaps be impacted differently had there not been anthropogenic influence to the same degree there has been in the past.

Human resource use is not equally distributed across nations. Consequently, conflict and dispute can arise over the acquisition and use of resources valued by multiple competing interests. These interests can be both directly and indirectly tied to the resources themselves. For example, oil, precious metals, food, and water are a few of the resources with direct ties to human interests that have historically caused conflict (Colgan, 2010; D'Souza et al., 2013; Haftendorn, 2000; Idrobo et al., 2014). Private commercial organizations and the public sector have stakes in natural resources for multiple reasons, including potential economic benefits. A large number of private companies have profited from natural resource use and commercialization of goods, as in the obvious example of the oil industry (Ford, 2011). That said, the challenges faced by private economic interests can be indirectly tied to resources. A fishery closure could have cascading economic impacts at family, regional and national levels (Hattam et al., 2014). Nation states have an interest in exploiting natural resources for economic purposes as well. Energy production via oil, nuclear, and other more sustainable energy options (e.g. solar and wind) can generate important economic contributions to a nation's gross domestic product (GDP). Other examples include the economic recreational value that natural resources have through activities such as fishing, boating, hunting. In the state of Oregon alone, outdoor recreation brought in over 50 million visitors to state parks in fiscal year 2017 (OPRD, 2017).

It is clear there are multiple competing interests for the use of natural resources. Natural resources are impacted by the various human activities that can be extractive in nature. Some of these resources are of high importance to societies and as such can lead to sources of dispute and conflict over their uses. Resource management has been an approach used by government entities in the past to deal with some of these resource use conflicts.

1.1 A Need for Natural Resource Management

We now are at an interface where opportunity-seeking human activity meets the finite availability of natural resources. This interface has created a need for resource management. This need has led societies and governments to establish management regimes in order to provide solutions. However, when many nations or jurisdictions compete for similar resources

in space and time, challenges and conflicts are likely to arise (Haftendorn, 2000; Hendrix et al., 2011). In the U.S. there are jurisdictional disputes over a multitude of resources. Development of our coastlines provides a clear example. Disputes are common over which state or federal agency has the final jurisdiction or regulatory authority regarding proposed development projects along the coast (Bauer et al., 2008).

Creation of natural resource management (NRM) agencies is a contemporary government approach used to address societal disputes over environmental issues. There are many different natural resource management agencies, and they have a wide range of missions and directives. At the international level, the United States collaborates internationally to address environmental and other NRM related issues such as: 1) the Intergovernmental Panel on Climate Change (IPCC) to address climate change, 2) the United Nations Food and Agriculture Organization (UN FAO) dedicated to addressing fishing regulations, or, more recently, 3) the Paris Climate Agreement from which the United States withdrew (Chesnaye et al., 2001; Pramod et al., 2014; UNFCCC, 2018).

At a national level, there are agencies at the federal, state, and local levels. NOAA Fisheries, which is within the Department of Commerce and an arm of NOAA (National Oceanic and Atmospheric Administration), is a federal agency responsible for overseeing the state of the nation's ocean resources and habitat (NOAA, 2018). Conservation of economically important fish stocks is just one of many environmental issues this agency is concerned with. The United States Geological Survey (USGS), another Federal example, is a scientific agency within the Department of the Interior focused on better understanding the earth's natural systems for the best management of water, biological, and geological resources (USGS, 2018).

At the state level, the number and types of NRM agencies are quite diverse, with over 100 state agencies in Oregon alone as just one example (DAS, 2018). However, there are some relatively standard agencies such as State Parks, Fish and Wildlife, and Departments of Environmental Quality across the states. A number of agencies and professionals work daily across multidisciplinary fields to address the many different marine-related environmental issues occurring nationally and internationally.

When issues involving the marine environment meet the complex problems associated with various human activities, such as jurisdictional conflict and dispute, there is a need for management and marine resource management (MRM) specifically. In the marine environment conflicts over human use are a common occurrence, from issues involving marine spatial planning (MSP) to ecosystem-based fisheries management (EBFM) (Olson, 2011; Tuda et al., 2014). Fortunately, efforts have been made to address these more specific environmental concerns through the concerted efforts of multiple governing bodies.

1.2 Marine Resource Management

From coast to coast and all across the globe, people use marine resources in one form or another. Whether being a part of a commercial fishing fleet, developing a shore line, enjoying running on the beach, facilitating a kayaking tour, or engaging in international shipping, people hold a large interest in marine resource use. With so many different activities competing for space and use of similar marine resources, there are bound to be impacts for the resources themselves or those utilizing them. For example, ecosystems-specific impacts can range from the over-harvesting of fisheries to point and nonpoint sources of water pollution (Burgess, et al., 2013; Fujioka, 2001). Human social impacts can range from the economic consequences associated with fishery closures to the regulating of recreational and commercial boating space for various activities and interests (Hattam et al., 2014; Tuda et al., 2014). Often these impacts are addressed by MRM in one form or another. MRM programs can address some of these issues of human use, impact, and access as well as promoting safety and raising environmental literacy, and stewardship.

Indeed, many issues can be addressed under the umbrella of MRM, and many different approaches exist to address the complex spectrum of MRM issues. Managers employ different techniques such as forming partnerships with other governments entities, partnerships between states and within a state, and partnerships with stakeholders and local communities, which provide public input and opportunities to participate in efforts to address environmental issues (Diduck, 1999; Hillman et al., 2005). Conducting research to inform decision makers is another way to approach some of these complex management challenges. As Robinson et al.

(2012) describe, both social and natural science research help to inform management. In fact, it can be often difficult to move forward with management initiatives without the explicit use of research to inform MRM-related decisions (Weeks et al., 2018). Often the creation of regulation and policy dictates how an MRM agency will approach solutions to the dynamic problems it faces. For example, the Oregon Department of Fish and Wildlife (ODFW) is an agency with regularly changing regulations that are shaped by the research they conduct. In the past, accumulation of toxins in shellfish has been a matter of public safety in Oregon. The ODFW relies on the research conducted within the department to inform management decisions about water quality as it relates to the take of marine species such as Dungeness crab, a commercially important fishery in Oregon (Rahaim, 2018; Ess, 2017). However, in order for these various policies to carry any weight and be effective, the development of regulations must be coupled with compliance and enforcement.

NRM agencies rely on enforcement to ensure there is compliance with the various MRM-related regulations. Law enforcement can act as a tool or an extension of an NRM agency's managerial authority. The United States Coast Guard (USCG) operates at the federal level to ensure compliance with marine law in federal waters. NOAA has its own law enforcement division as well to enforce matters relating to federal fisheries management. At the state level, state police or game wardens specifically address NRM-related law.

States differ in how they delegate enforcement authority over these issues. As an example, California uses the California Department of Fish and Wildlife (CDFW) game wardens to provide regulation enforcement. Other states like Oregon delegate that authority to the Oregon State Police (OSP). The OSP operates independently but in coordination with ODFW to enforce fish and wildlife regulations. These officers patrol to monitor various activities such as poaching, aquatic invasive species, and public safety. MRM enforcement makes policy actionable in terms of achieving compliance. Beyond mere compliance, MRM-related regulations seek to keep people safe and informed and strive to promote environmental stewardship. Without the help of law enforcement officers, however, there would not be a

designated body tasked with ensuring that the public acts in accordance with legislation and policy approved through the democratic process.

1.3 Law Enforcement and Training

Law enforcement officers perform a variety of tasks. The various position requirements, whether federal or state, drug enforcement or marine law enforcement (just to name a few), along with the dynamic nature of the job suggests a variation in agency objectives to meet their often-changing needs. While different law enforcement agencies may have different directives, their jobs can be dangerous. Officers find themselves in high-pressure situations where quick decisions not only are required, but also can have long lasting effects (physical and psychological) as well as put agencies at risk for civil liability. This is seen in news coverage of stories about fatal shootings or incidents involving use of force (Andone, 2018; Associated Press 2018).

To reduce this risk, law enforcement agency managers often seek various forms of training for officers. Law enforcement training is not a new concept (Giovengo, 2017; Calhoun 1996; Trautman, 1986), and it can be tailored to specific needs. For example, federal law enforcement officers such as customs and border officials receive training at the Federal Law Enforcement Training Center (FLETC). Additionally, any municipal or state law enforcement officer has to go through a basic academy before joining an agency. This is a requirement for preparing officers for the specific and unique conditions they will work in.

Once established in an agency, officers often receive continuing professional education throughout their career. Continuing education in law enforcement can span a wide range of topics, from courses on investigation techniques to issues of ethics and best practices in the workplace (Giovengo, 2017). In addition to reducing the potential for civil liabilities, continuing education and training strives to ensure that officers are best prepared for the multitude of situations they encounter in their daily jobs. With that in mind, law enforcement training is a socially significant and timely issue for training effectiveness research.

1.3.1 Training and E-Learning

Two approaches for instruction have been at the forefront of law enforcement officer training and continuing education. Traditionally, classroom-based, face-to-face instruction has been a main mode of content delivery (Leal, 2009). In recent years, e-Learning has begun to compete with this standard form of instruction (Desai et al, 2006; Leal, 2009; Schmeeckle, 2003). Today e-Learning is becoming more prevalent as a training option (Desai et al., 2006). E-Learning, or online learning, describes instruction that occurs either entirely or in part online via web-based platforms.

E-Learning can be a viable option in areas of technical and non-technical training. Other groups similar to law enforcement that require specialized or technical training have made transitions towards e-Learning. Divisions of the military, especially the U.S. Navy and U.S. Army, have used online training for their personnel (Artino, 2007; Lenahan-Bernard, 2015). Additionally, aviation pilots have adopted e-Learning training programs to provide essential training for these demanding jobs (Kearns, 2011). It is increasingly apparent that e-Learning is becoming an option for technical training fields.

College campuses have been a major avenue for the growth of e-Learning (Leal, 2009). In fact, Desai et al. (2006) describe the growth of “mega universities” that have massive student enrollment because of their online learning capabilities. However, forms of online learning have been used both in the academic and corporate environments as well for decades now showing a recognition that technology can play an important role in training and development (Schmeeckle, 2003).

Schmeeckle (2009) illustrates how law enforcement training has experimented with online training for over a decade now. This may in part be due to wide-spread recognition of the potential benefits offered by e-Learning approaches. Factors such as the ability to learn from virtually anywhere and at a self-regulated pace have contributed to online learning’s popularity of (Desai et al., 2006; Leal, 2009; Pourghaznein et al., 2015). Synchronous and asynchronous e-learning format options have facilitated this capability for learners to learn

from virtually anywhere with internet connection. Synchronous e-Learning is designed to move the entire class and overall course forward at the same pace. Often this can include an instructor available to students through a live feed. Asynchronous e-Learning allows learners to log in individually and complete the course at their preferred pace.

E-Learning research in general has focused on understanding memory recall and retention. There is evidence to suggest that e-Learning can in fact yield better measures of retention (Pourghaznein et al., 2015). However, different variables can contribute to retention variations such as cognitive capability and preferred learning method (Torun and Altun, 2014). Therefore, e-Learning can be limited by its design and implementation. For many, preference or ability to maintain focus make up the individual factors that can make successful e-Learning a challenge. Other important individual factors that could limit students' capacity to benefit from e-Learning include their ability to cognitively absorb content-load and their level of computer self-efficacy (Sahasrabudhe and Kanungo, 2014). This is to say that, in some instances well-crafted e-Learning programs can have limited to no impact on learning, depending on the learner.

The learner's attitude and motivation also have been shown to impact perception and content retention through e-Learning (Giovengo, 2017; Schmeckle, 2003). Instructional effectiveness can also increase when, along with attitude and motivation, students reach levels of sustained attention (Ilgaz et al., 2014). E-Learning can offer many cognitive benefits to learners. However, e-Learning environments can have too much visual stimulation at times, which can make attention difficult during the learning process. This is not to suggest that the choice of instructional medium is not important. In fact, research suggests that effectively designed e-learning programs using multimedia can contribute to meeting learning outcomes (Chen et al., 2010). Well-balanced uses of distinctive visual elements in e-Learning environments can help to achieve effective learning results (Ilgaz et al. 2014).

Improving visual elements can be expensive and not an option for certain entities wishing to cut costs where possible. When designing e-Learning curricula, however, practitioners may wish to consider higher forms of multimedia that can help achieve greater

levels of concentration (Liu, Liao, and Pratt, 2009). When designing e-Learning, some researchers and practitioners have adopted different comprehensive design models like ADDIE (Analysis, Design, Development, Implementation and Evaluation) (Arshavskiy, M. (2017). When approaching design specifically, there is research to suggest that following the Cognitivist Theory of Learning, which frames how students learn, is an appropriate theoretical approach (Sahasrabudhe & Kanungo, 2014).

Interactivity, a component of e-Learning design, has been identified as an essential component impacting the engagement of the learner (i.e. concentration, motivation, and perception) as well as meeting learning outcomes (i.e. retention) (Chen, et al. 2010). This suggests that while the choice of multimedia is important, the multimedia elements of interactivity is another critical component in e-Learning design. Chen et al. (2010) remark how effective education necessitates critical elements such as collaboration, prompt feedback, and components facilitating interactive and active learning.

Hybrid course options implementing e-Learning can promote the inclusion of interactivity as well. Additionally, hybrid courses offered in both a-synchronous and synchronous formats have been shown to be more effective options for learners compared to non-hybrid alternatives (Chen et al., 2010). Synchronous e-Learning formats have been argued to be effective at promoting interactivity, especially compared to asynchronous options (Hrastinski, Keller, & Carlsson, 2010). Asynchronous e-Learning however, has been shown to be a more effective option to promote deeper levels of thinking and reflection on the part of the learner (C. C. Robinson & Hullinger, 2008).

Beyond the mere popularity of online learning as potential for distance education and self-pacing, the body of research pointing to the educational value of online learning has continued to grow. Indeed, as it compares to classroom-based instruction, online instruction at times has been found to be at least as effective at meeting learning outcomes as classroom-based approaches (Pourghaznein et al., 2015; Schmeckle, 2003).

Despite the popularity, there are also perceived negatives associated with e-Learning when compared to more traditional forms of instruction. For some the e-Learning environment is simply not conducive to their learning styles. For example, Giovengo (2017) describes generational differences in preferred learning styles, a discovery supported also by Leal (2009). From this perspective, an important interaction is lost when moving from an in-person to online learning platform where students are separated in both space and time (Leal, 2009). Furthermore, depending on the teaching and learning content, there may be a greater requirement for in-person instruction to use hands-on learning that cannot be easily replicated using e-Learning tools.

Agencies have experimented with several forms of e-Learning over the past decades. However, training law enforcement officers with more exclusive uses of e-Learning platforms is relatively new and is an area of growing research. Nonetheless, little is known about how e-Learning training impacts MRM law enforcement officers, because their duties and respective trainings are situation-specific.

Training is costly, especially for law enforcement agencies that are tasked to train officers across the nation, spending thousands of dollars annually (Giovengo, 2017; Leal, 2009). Agencies want to invest in training approaches they know are effective and can produce desired outcomes. Determining these impacts can be an important area of inquiry. In fact, effective instruction has been a goal not just of training platforms in general, but also of law enforcement training programs (Schmeeckle, 2003). Evaluation and research to investigate the effectiveness of law enforcement training programs is an ongoing process.

Recognizing the need to understand the effectiveness and impact of training approaches on law enforcement performance, this study examines a particular training program in the state of Oregon. Using a case study approach, the study seeks to elucidate the impact of an e-Learning platform on a MRM officer hybrid-training program comprised of content instruction and field-based scenario training. The study frames the research concern as follows:

In what ways does an online platform contribute to a hybrid training program delivered by a natural resource management agency?

1.3.2 Case Study

The Oregon State Marine Board (OSMB) is a state agency tasked with managing Oregon's boating waterways and serving "Oregon's recreational boating public through education, enforcement, access, and environmental stewardship for a safe and enjoyable experience" (OSMB, 2018). The OSMB provides marine law enforcement to the state through contracting work with the OSP, Fish and Wildlife Division and participating county sheriff offices throughout most of the state. These contracted agencies provide marine law enforcement for all of Oregon's lakes, rivers, and coastal waterbodies. The OSMB requires potential marine deputies to attend its annual Marine Law Enforcement Academy (MLEA). The MLEA is aimed at giving officers the necessary basic training they need to begin their careers in marine law enforcement.

The OSMB hosts the MLEA each year for new officers who are going to become state marine deputies. Traditionally, this academy has consisted of a two-week program. In the first week officers would receive classroom-based instruction regarding all of the relevant content they were expected to learn. This content consisted of a wide range of boating laws, including understanding what equipment was required aboard vessels of all different types, what constitutes safe boating operations, what is required of liveries and outfitter guides and officer protocol for a number of procedures such as boat accident investigations.

The second week of the MLEA, considered the field portion of the academy, focuses on providing officers with hands-on training relative to the duties of their job. This involves instructional boat handling, maneuvering on the water, scenario-based training, and various other pertinent hands-on activities. This second week gives the officers the ability to apply the content learned in the previous week to scenarios on the water in an environment similar to where they will be working. In this way, the training program provided by the OSMB over the

years constitutes a hybrid training program by bringing these different modes of instruction together to form the training academy.

In 2017, the OSMB proposed a different approach to the MLEA than they had taken in years prior. The OSMB made the decision to replace the first week, the classroom-based training, with online training. This shift to experimenting with e-Learning platforms represents a departure from the standard method of content delivery and instruction. The reasons for this move were multifold. One factor was the potential for cost savings by moving to e-Learning, which has been noted as one component that makes e-Learning attractive in the first place (Pourghaznein et al., 2015). Another motivating factor is the opportunity e-Learning provides for distance learning.

The OSMB expressed interest in understanding the role that e-Learning might play in the future of the MLEA. They wanted to know if e-Learning could be a viable option to meet their educational and administrative needs in the future.

1.3.3 E-Learning Curriculum

The OSMB staff began developing the e-Learning platform in August 2016 in preparation for the MLEA in 2017. The first phase involved OSMB staff identifying what learning management system (LMS) they would choose. The state of Oregon uses an LMS known as iLearn, and the OSMB decided to use this platform for the MLEA e-Learning program. Additionally, the OSMB staff decided to use the software program Adobe Captivate to develop the specific MLEA online material to be uploaded to iLearn. The online material developed in Adobe Captivate was created by collecting PowerPoint presentations used by academy instructors at previous MLEA trainings. These presentations covered a range of topics that students at the academy must become familiar with to pass the MLEA and fulfill their job duties. The PowerPoint presentations were grouped by similar categories and presented as four separate modules on the iLearn LMS. Within a specific module, the students were quizzed after each section before proceeding to the next.

1.3.4 Study Focus

A partnership between the Marine Resource Management (MRM) graduate program within the College of Earth, Ocean and Atmospheric Sciences (CEOAS) at Oregon State University and the OSMB was then formed to examine *the ways in which an online platform can contribute to a hybrid training program*. This study looks at the MLEA to better understand how e-Learning impacted officer training and development. For example, could we better understand the role of e-Learning through a comparative study? If so, what would constitute an appropriate situation for relative comparison? Might interviews provide insights into the contributions e-Learning made to the hybrid training programs? With these questions and interests in mind, and a case study of a marine law enforcement training academy as the research setting, this study seeks to address the following research questions (RQ):

RQ₁: *In what ways does an online platform contribute to differences in retention compared to classroom-based instruction?*

RQ₂: *In what ways does an online platform impact perception of training?*

Since there are MRM issues facing our societies today, and marine law enforcement is a strategic approach to addressing these issues, how might officer training impact the dynamic marine issues we face? What's more, how can research related to e-Learning's contribution to the training add to that conversation? It is expected that the findings of this work could clearly demonstrate aspects impacting training. Understanding both the attitudes and motivations behind those involved with this training program and the retention of content could further inform the dialogue on the best practices for law enforcement training within the unique context of MRM and more generally.

Chapter 2: Methodology

2.1 Study Background

In September 2016 the OSMB decided to experiment with an e-Learning platform for the classroom portion of their 2017 MLEA. The goal of this study was to gather the necessary data from the 2017 academy and then to collect additional data the following year, not knowing whether the following year would consist of an e-Learning format or return to the traditional classroom-based instruction. Ultimately the OSMB decided to return to the traditional classroom model in 2018. Consequently, the focus of this research shifted to specifically observe and understand potential differences between academy years with regards to retention of content presented (by administering an in-person questionnaire), and the impacts of e-Learning on perception of training (by conducting interviews with academy participants and MLEA facilitators such as instructors and OSMB staff).

Research subjects who participated in the 2017 training partook in both the online and in-person instruction as part of the MLEA. Those who participated in the 2018 MLEA did not receive online content instruction.

We then examined how the 2018 academy compared to the 2017 academy, with the sampling assumption that both the 2018 cohort and the training delivery method were not substantially different from those of academy years before e-Learning. This assumption suggests representing the returning classroom-based approach in 2018 as the “norm” or normal/traditional mode of instruction.

2.1.1 *Study Participants*

The MLEA brings together law enforcement officers from across the state and from different agencies such as sheriff’s offices in Polk County, Morrow County, Lane County and others. The study sample consisted of multiple categories within two different populations: students and non-students. Tables 1 and 2 illustrate participant categories (students) and MLEA facilitators (non-students) and the numbers distributed across two modes of data collection: surveys and interviews.

Table 1

	<u>Groups Surveyed</u>		
	2017 MLEA (e-Learning)	2018 MLEA (Classroom)	MLEA Facilitators
N	28	31	6
Survey	X	X	

Table 2

	<u>Groups Interviewed</u>		
	2017 MLEA (e-Learning)	2018 MLEA (Classroom)	MLEA Facilitators
N	13	31	6
Semi-Structured Interviews	X		X

A census sampling procedure was employed. The survey population included MLEA student participants for both years (2017, n=28 and 2018, n=31), which consisted of county law enforcement officers, tribal police, and students from the Fish and Wildlife Division of the Oregon State Police (OSP). Every student received and completed the survey in both academies, yielding a 100% response for each group. The interview sample was different from the survey population; academy participants who only received classroom-based instruction in 2018 were not interviewed.

The interview process used a purposive sampling technique. The first group of interviewees was comprised of several students (n=13) from the 2017 MLEA who participated in the online course. The second group of interviewees (MLEA Facilitators; n=6) included MLEA instructors (for both content and boat-handling), and OSMB staff and regional law enforcement supervisors. Because they have different priorities, these two groups were interviewed in order to provide different perspectives about MLEA and training modes. The first group provided perspective from the receiving end of instruction; the second was concerned with content development and delivery.

2.2 Data Collection

Najjar (1997) describes testing in studies, whether verbal or textual, as a way to analyze multimedia instruction to assess the recall of information presented. In this way, the surveys were used to provide an assessment of MLEA participants' recall of the content presented to them. Pourghaznein et al. (2015) used surveys to assess retention amongst participants in e-Learning for training in the medical field, finding that retention differences did indeed surface between e-Learning and classroom-based instruction. Following Schmeekle (2003), this study uses a mixed methods approach to look at learning, motivation, and attitude as outcomes. Interviews in this study were semi-structured, with a set of pre-determined questions for each targeted interview group approved by OSU's Institutional Review Board (IRB) prior to administration. The interviewer let the interviewees navigate their own responses, using probing methods or phrases to encourage the interview subject to elaborate on topics mentioned. Interviews also provided clarification on learning to help the researcher better understand the interview subject's personal experience, thus highlighting motivation and attitude.

2.2.1 *Semi-Structured Interviews*

A grounded theory approach as described in Auerbach and Silverstein (2003) was used to gather qualitative data from the interviews. These interviews were then later analyzed to illuminate patterns and themes within the data, leading to a theoretical narrative regarding the experiences of participants and MLEA facilitators in 2017. In contrast to other approaches that work from pre-established theory to generate hypotheses, grounded theory approaches a study with a research concern or interest at the beginning, but not predicting ahead of time what the data will reveal. It also has been termed a hypothesis-generating approach, as it is often employed by using data analysis to create questions that may be answered with other subsequent studies.

Interview participants were recruited via email messages and phone calls through contact information provided from the OSMB Law Enforcement database. Just under half (n=13, 46%) of contacts completed an interview. The types of questions varied for the two

groups of participants (Appendix D). All interviewees provided verbal consent before providing responses to questions designed to capture personal experiences regarding the online learning used in the MLEA, the training in general, and its effectiveness on improving job performance. The interviews varied individually but generally lasted 30 minutes. Interviews were conducted in person or over the phone. Interviews were convened at the time selected by the interview subject.

2.2.2 Survey Data

Kulik and Kulik, (1991) along with Schmeckle (2003) used exam scores as metrics for retention. This study follows a similar approach. Two surveys were administered in this study. In 2017, academy participants who took the online course had two weeks to complete the online course before arriving for the first day of the face-to-face portion of the MLEA. The survey was administered on day one of the academy. How much time had passed since each participant had completed online training was unknown; participants could have completed the online course at different times prior to arrival (possibly an un-accounted for variable that could exert some influence on retention or perception results related to the 2017 year). A similar survey was administered at the 2018 MLEA at the end of week one; where the same content was covered as was covered in the 2017 online course, but it was delivered face-to-face.

The surveys for both years were made up of two census samples; all MLEA participants were surveyed and thus for both years there was 100% response from academy participants (n=28, 2017; n=31, 2018). The collected paper-based survey responses from 2017 were then input into IBM SPSS and Microsoft Excel.

2.2.3 Survey Design

Information collected on individual officers consisted only of names and whether they worked for 1) county 2) OSP or 3) other. The two groups of MLEA student participants for both years consisted of county law enforcement officers, tribal police, and students from the Oregon State Police (OSP), Fish and Wildlife Division. Other personal information that may be common on other surveys such as age, gender, or ethnicity were not collected in this survey, as it was determined to be not relevant to the overall research interest.

The surveys administered to participants in 2017 and 2018 were composed of identical content-related questions to ensure consistency and reliability of answer responses to questions related to retention differences. The majority of content questions chosen for the surveys were pulled from tests previously delivered post-instruction at the MLEA in prior years, as far back as 2011 and as recent as 2016. The survey consisted of 55 content-related questions (Appendix A and B) categorized into different groups of questions (n=10) based on a topic (i.e. Aquatic Invasive Species (AIS) and Rules of Boating Operation (RBO)). The questions related to course experience were different between years. The 2017 survey consisted of questions regarding the experience taking the online course. The 2018 survey asked questions specific to experiences taking the classroom-based course.

2.3 Data Analysis

2.3.1 Survey Data

This study used IBM SPSS Statistics and Microsoft Excel to analyze the quantitative survey data. All survey questions were manually entered into SPSS initially and the categorical responses or “answer options” from the surveys were converted into numerical data before exporting to an Excel format. True or false answers were coded as 1 and 2 respectively. Answers with more than two options were coded as 1, 2, 3 etc. in the order that they were presented on the survey. The Excel software program was used initially to organize the quantitative survey data and run preliminary descriptive statistics. All participant answers were organized into one spreadsheet in Excel. All participant names were converted into numerical code for each year to remove direct identifiers in accordance with OSU’s IRB requirements. Mean test scores for the overall survey and categorical means for the different sections were calculated. In order to do this, each individual test was examined one at a time in the Excel spreadsheet to mark for incorrect answers. Using a survey answer sheet as a guide, each survey and the answers therein were cross-referenced with the correct answers. To better understand if there were any differences in performance relative to certain topics of content in the

different years, the mean scores for each category were then computed for both years in addition to the participants' overall test scores.

In addition to overall and categorical averages, other descriptive statistics such as total answers incorrect per officer or per category and percent answered incorrect for each category, officer and overall, were also calculated.

In order to provide some more robust comparative analysis, it was decided to explore the use of the t-test as a way to compare means. Following the statistical approach described in Field (2015), t-tests were conducted and analyzed comparing various means extrapolated from the 2017 and 2018 survey data sets. The two sets of survey data represented two independent samples, as one group had no influence on the other group. Thus, an independent samples t-test was the appropriate test to run to compare our parameters of interest. With a null hypothesis assuming there would be no difference of any kind in average score performances between years, a two-tailed t-test was the specific test chosen. Significant values would have p-values of 0.5 or less.

Comparing means with a t-test highlights where significant differences in the outcomes may occur. The parameters of interest here are differences in mean scores. However, to run a t-test the distribution of the data has to be analyzed to look for normality in the distribution of the data, as well as variance and skew. Analyzing the normality of the distribution of the data is a part of determining whether the data meet the assumptions of the t-test. These assumptions have to be met before running the test in order to understand how well the t-test will accurately describe the data. The assumptions include analyzing the normality of distribution, homogeneity of variance, and looking for skew and kurtosis. If it is determined that the data do not meet one or more of the assumptions of the t-test, other statistical tests are explored to account for these violations while still examining for significant differences. However, following the instruction of Field (2015), the author argues in favor of a specific approach when encountering non-normal data. This approach uses the "Bootstrapping" function in SPSS. This process essentially takes and replicates samples within the data to get an idea of a normal distribution based on the data collected. This provides a comparison of a normal distribution based on collected data to allow checking for significant differences. Thus, if it appears that

portions of the data are not normally distributed and violate t-test assumptions, the Bootstrapping function is then run to see if a significant difference could still not be found when accounting for skewed or non-normal data. In this study t-tests were conducted on the overall score means and the categorical means, using the bootstrap function where appropriate, to create a thorough investigation into any potential differences in mean outcomes between the two different samples.

2.3.2 Interview Data

All of the 19 audio-recorded interviews went through an initial transcription phase that involved listening to each audio-recorded interview at the slow speed using Express Scribe Transcription Software. All recorded audio interviews were transcribed onto Microsoft Office Word files and categorized by interview subject and the appropriate group to which it belonged.

The data were analyzed using qualitative data coding software (MAXQDA). All transcribed audio interview files were uploaded into this software program to begin the search for relevant text and the coding process. There were 65 initial codes for the 2017 MLEA Participant group and 53 initial codes for the MLEA facilitator group. When qualitative researchers reach the point that no new codes are being created, it indicates that additional ideas have already been referenced and the text is not adding any new relevant material (data saturation). The goal of the coding process is to create a comprehensive list of all repeating ideas across interviews, both within groups and between groups. If a particular idea was repeated frequently across interviews, this was taken to indicate the level of relevance of that particular idea. Before moving through the repeating ideas phase, the lists of repeating ideas in both groups were analyzed separately to determine if some of the repeating ideas would be better served if combined with other very similar ideas, or broken into multiple repeating ideas if the initial repeating idea was too broad and breaking it into separate repeating ideas would better explain the ideas in higher resolution. With this done, it became easier to organize the narrative content before moving into the next stage of analysis.

After the coding process was complete these repeating ideas were then grouped into larger groups of similar repeating ideas to create themes. Themes were used to identify some of the broader topics discussed by the interview subjects. These themes inform RQ₂ at a lower resolution but discuss the content described in broader terms.

The final stage of the qualitative analysis involved moving the themes into theoretical constructs that ultimately formed the theoretical narrative describing what the research subjects discussed in the context of our research question and our overall research interest. The theoretical constructs bring together the themes and describe them in a more abstract way that connects the repeating ideas to the bigger picture. This often requires developing theories based on what is found in the textual data (Auerbach and Silverstein, 2003). Once these constructs are developed and identified, they are presented in a narrative that formats the relevant repeating ideas and themes to coherently describe them.

Chapter 3: Results and Discussion

The results of this study address two different research questions through the use of a mixed-methods approach – quantitative data from the surveys and qualitative data from the interviews conducted – to answer RQ₁ and RQ₂. Results are broken down into three general categories: in-person training, e-Learning, and the application of content learned to the job of a law enforcement officer (deputy). Listed under each category are the themes that were identified in the data analysis. Direct quotes are presented (in italics) to reflect perspectives held by multiple research participants.

3.1 In-Person Training

3.1.1 Retention of Content

Personal Preference:

When it came to discussing the MLEA in the context of classroom-based training, the overwhelming majority of officers interviewed preferred the classroom format for instruction. Some officers identified specific components of a classroom environment that made classroom training their preferred method of learning and absorbing content. Others simply expressed a general preference:

For me, I need that person standing in front of me talking. I need that interaction. For some reason I just can't sit here and learn off the computer.

No Difference in Overall Performance:

Many participants felt hands-on training helped them to better understand the content being instructed. The hands-on aspects of both the boat handling (field training) and the classroom-based instruction were identified as important for learning. To examine this idea further, an analysis of the survey data was conducted to explain differences in content retention, comparing e-Learning to classroom instruction. When looking at overall average scores from the e-Learning environment and the classroom environment, there appeared to be no significant differences in retention.

Table 3.

2017 vs. 2018 Independent Samples T-Test for Overall Test Scores							
		F	Sig.	t	Sig. (2-tailed)	Mean Difference	Std. Error
All test scores	Equal variance assumed	.43	.52	.63	.53	.01	.01
	Equal variance not assumed			.63	.53	.01	.01

Note. T-test comparing difference in total average survey score in 2017 and 2018. Significant values are $p < 0.05$ denoted under the “Sig. (2-tailed)” column. Significance values shown are greater than 0.05, indicating no significant differences in the overall test scores from 2017 and 2018

After completing a parametric, independent samples t-test in SPSS, the p-value ($p > 0.05$) suggests no significant difference in overall average test score between the two years. The two-tailed test statistic was used to determine if there was any significant difference at all, independently of what year did better. Since the data were normally distributed, there was no need to use a bootstrapping function in SPSS to correct for normality assumption violations.

Performance of MLEA Participant Sub-groups:

Officers interviewed highlighted their perspectives on the importance of in-person and classroom training approaches while having been exposed only to the e-Learning training. Tables 4 and 5 (below) present the performance of officers (split up by officer group and grouped together) exposed to the traditional MLEA training course (classroom-based), presented both as overall and by category of question, thus providing insights on retention and overall performance of officers with regard to course content.

Table 4.

2018 Overall Test Score Performance by Officer Type			
Student Category	N	Mean	Standard Deviation
County	20	0.88	0.05
OSP	7	0.87	0.04
Other	4	0.82	0.04
Total	31	0.87	0.05

Note. The table above indicates the average mean overall test score on the survey in 2018. The table is broken down by officer category (County, OSP or Other). In addition, the total average is given. The county officers displayed the highest mean overall score, followed by OSP, and then “Other”.

Table 5.

		2018 Test Score Performance by Category and Officer Type									
		Survey Question Categories									
Student Category		AIS	CRG_REQ	RBO	OFCR_P	UNQE_EN	BUII	ECTRC_SHK	CSE_STDY	ABNDN_BTS	MNDTY_ED
County	N	20									
	Mean	0.64	0.86	0.89	0.90	0.76	0.93	0.98	1.00	0.98	1.00
	Std. Dev.	0.25	0.15	0.07	0.06	0.19	0.24	0.11	0.00	0.11	0.00
OSP	N	7									
	Mean	0.79	0.78	0.88	0.87	0.82	0.86	1.00	1.00	1.00	1.00
	Std. Dev.	0.27	0.16	0.06	0.11	0.19	0.24	0.00	0.00	0.00	0.00
Other	N	4									
	Mean	0.50	0.79	0.87	0.90	0.50	0.75	1.00	1.00	0.88	1.00
	Std. Dev.	0.29	0.15	0.07	0.08	0.20	0.29	0.00	0.00	0.25	0.00
Total	N	31									
	Mean	0.65	0.83	0.89	0.89	0.74	0.89	0.98	1.00	0.97	1.00
	Std. Dev.	0.26	0.15	0.06	0.07	0.21	0.25	0.09	0.00	0.12	0.00

Note. Table displays the average scores for each category of question presented on the survey in 2018. Survey question categories are abbreviated in the manner they were used in the data entry process (AIS – Aquatic Invasive Species, RBO – Rules of Boater Operation, OFCR_P – Officer Procedures, UNQE_EN – Unique Encounters, BUII – Boating Under the Influence of Intoxicants, ECTRC_SHK – Electric Shock, CSE_STDY – Case Study, ABNDN_BTS – Abandoned Boats, MNDTY_ED – Mandatory Education.) Average scores are broken into officer categories (County, OSP or Other). Total average scores by category are also displayed at the bottom of the table.

Table 4 shows the overall average test score for those in the 2018 MLEA was 86.7%. This, according to OSMB staff, is above the 70 percent testing threshold that officers are expected to obtain.

When breaking down overall test score performance down by participant sub-group, the average scores were relatively tightly coupled. The county law enforcement participants, who comprised the largest portion of those attending the academy, had only a slightly better overall average test score than the other two participant groups (OSP and Other).

Breaking it down by the categories of questions asked, the county officer group outperformed the other groups on 3 of the 10 topic areas. Similarly, the OSP group outperformed the other groups on 3 of the ten areas. The Other group, representing tribal police, outperformed the other two groups on one area of the topics covered. (See Appendix A and Appendix B for category questions.)

Presented below in Table 6 are the overall and categorical average scores in table format from the 2017 MLEA where participants were trained with e-Learning supplementation.

Table 6.

2017 Overall Test Score Performance by Officer Type			
Student Category	N	Mean	Standard Deviation
County	17	0.87	0.06
OSP	11	0.89	0.04
Total	31	0.88	0.05

Note. The table above indicates the average mean overall test score on the survey in 2017. The table is broken down by officer category (County or OSP). In addition, the total average is given. The OSP officers displayed the highest mean overall score followed by county. *No Other group in 2017.

Table 7.

2017 Test Score Performance by Category and Officer Type												
Student Category			Survey Question Categories									
			AIS	CRG_REQ	RBO	OFCR_P	UNQE_EN	BUI_I	ECTR_C SHK	CSE_STD Y	ABNDN_BT S	MNDTY_ED
County	N	17										
	Mean		0.87	0.72	0.88	0.89	0.85	0.97	0.97	1.00	0.77	0.91
	Std. Dev.		0.18	0.13	0.08	0.06	0.16	0.12	0.12	0.00	0.26	0.20
OSP	N	11										
	Mean		0.75	0.80	0.90	0.89	0.84	1.00	1.00	1.00	0.96	0.91
	Std. Dev.		0.27	0.21	0.06	0.08	0.17	0.00	0.00	0.00	0.15	0.20
Total	N	28										
	Mean		0.82	0.75	0.89	0.89	0.85	0.98	0.98	1.00	0.84	0.91
	Std. Dev.		0.22	0.17	0.07	0.07	0.16	0.09	0.09	0.00	0.24	0.20

Note. Table displays the average scores for each category of question presented on the survey in 2017. Survey question categories are abbreviated in the manner they were used in the data entry process (AIS – Aquatic Invasive Species, RBO – Rules of Boater Operation, OFCR_P – Officer Procedures, UNQE_EN – Unique Encounters, BUII-Boating Under the Influence of Intoxicants, ECTRC_SHK – Electric Shock, CSE_STDY – Case Study, ABNDN_BT S – Abandoned Boats, MNDTY_ED – Mandatory Education.) Average scores are broken up into officer categories (County, OSP or Other). Total average scores by category are also displayed at the bottom of the table.

Tables 6 and 7 show officer performance on the survey administered in 2017, when students were exposed to e-Learning. The overall average test score for all the participants who took the survey (n=28) was 87.7%. This is a slightly higher overall average score than 2018, the year that received the classroom-based instruction. Overall OSP troopers had a higher overall score average in 2017 than county law enforcement. Taking a look at performance by category of question with each of the two participant sub-groups (County and OSP), categorical average scores were all coupled within ten percentage points aside from one category where the difference was greater than 15%. County law enforcement officers, who comprised the largest portion of the two sub groups (n=17), categorically outperformed OSP troopers (n=11) on 3 of

the 10 topic areas in terms of average score. OSP outperformed county law enforcement on 6 out of the 10 areas. One area was an exact tie in average score.

Differences by Topic:

Because initial analysis of the overall test scores indicated no significant difference in overall test performance, more robust analysis was conducted to observe if there were any significant differences between the two years as a function of the topic of question asked. While the overall score can provide a surface representation of differences in performance, topical analysis offers a more nuanced perspective.

Table 8.

Category Questions	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
AIS (Aquatic Invasive Species)	.27	31	.00	.84	31	.00
Carriage Requirements (CRG_REQ)	.24	31	.00	.85	31	.00
Rules of Boater Operation (RBO)	.19	31	.01	.91	31	.01
Officer Procedures (OFCR_P)	.29	31	.00	.84	31	.00
Unique Encounters (UNQE_EN)	.23	31	.00	.85	31	.00
Boating Under the Influence of Intoxicants (BUII)	.48	31	.00	.51	31	.00
Electric Shock (ECTRC_SHK)	.54	31	.00	.18	31	.00
Case Study (CSE_STDY)	.	31	.	.	31	.
Abandoned Boats (ABNDN_BTS)	.54	31	.00	.27	31	.00
Mandatory Education (MNDTY_ED)	.	31	.	.	31	.

Note. Table shows the relative distribution of normality for each category of question in 2018. Two different tests for normality are displayed here (Kolmogorov-Smirnov and Shapiro-Wilk). P-values ≤ 0.05 indicate significant difference from a normal distribution. P-values are located under "Sig." columns. Both tests show that responses to survey category questions were significantly different from a normal distribution.

- a. Lilliefors Significance Correction
- b. Category: Abbreviated Categories of questions

After the statistical analysis of normality distribution was conducted the results indicated that there was a significant difference from a normal distribution in each category of question on the survey test for the 2018 participant group. This was used to inform what type of t-test to conduct. However, an analysis of the 2017 data normality had to be conducted as well.

Table 9.

Testing Normality Distributions in 2017 Category Responses

Category	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
AIS (Aquatic Invasive Species)	.32	28	.00	.77	28	.00
Carriage Requirements (CRG_REQ)	.22	28	.00	.89	28	.01
Rules of Boater Operation (RBO)	.17	28	.04	.93	28	.06
Officer Procedures (OFCR_P)	.35	28	.00	.79	28	.00
Unique Encounters (UNQE_EN)	.30	28	.00	.75	28	.00
Boating Under the Influence of Intoxicants (BUII)	.54	28	.00	.19	28	.00
Electric Shock (ECTRC_SHK)	.54	28	.00	.19	28	.00
Case Study (CSE_STDY)	.	28	.	.	28	.
Abandoned Boats (ABNDN_BTS)	.43	28	.00	.59	28	.00
Mandatory Education (MNDTY_ED)	.50	28	.00	.47	28	.00

Note. Table shows the relative distribution of normality for each category of question in 2018. Two different tests for normality are displayed here (Kolmogorov-Smirnov and Shapiro-Wilk). P-values ≤ 0.05 indicate significant difference from a normal distribution. P-values are located under "Sig." columns. Both tests show that responses to survey category questions were significantly different from a normal distribution.

a. Lilliefors Significance Correction

b. Category: Abbreviated Categories of questions

The normality tests for the 2017 year by category indicated as well that there was a significant difference from a normal distribution. The observed lack of normality in the distribution of the categorical data warranted the use of the bootstrapping function in SPSS to conduct t-tests to explore significant differences by category that may have occurred,

Table 10.

		2017 vs. 2018 Bootstrapping for Significant Differences by Category					95% Confidence Interval	
Question Categories		Mean Diff.	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper	
AIS	EV not assumed	.17	-.00	.06		.05	.29	
Carriage Requirements	EV not assumed	-.08	.00	.04	.05	-.16	-.00	
Rules of Boater Operation	EV not assumed	.01	.00	.02	.77	-.03	.04	
Officer Procedures	EV not assumed	-.00	-.00	.02		-.04	.04	
Unique Encounters	EV not assumed	.11	.00	.05	.03	.01	.20	
Boating Under the Influence of Intoxicants	EV not assumed	.10	.00	.05	.07	.01	.19	
Electric Shock	EV not assumed	-.00	-.00 ^b	.03 ^b	.93 ^b	-.05 ^b	.04 ^b	
Abandoned Boats	EV not assumed	-.13	-.00	.05	.02	-.23	-.03	
Mandatory Education	EV not assumed	-.09	-.00 ^c	.04 ^c	.04^c	-.17 ^c	-.02 ^c	

Note. Table displays the bootstrapped t-test results for each category of survey question, comparing 2017 with 2018. Significant values have a p-value < or = to 0.05. P-values are displayed under the “Sig. (2-tailed)” column. Of the nine categories, four categories of survey questions displayed significant differences in the scores in 2017 and 2018 (Carriage Requirements, Unique Encounters, Abandoned Boats and Mandatory Education). Equal Variances were not assumed given a lack of normal distribution in average scores within each survey group (2017 & 2018).

- a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples.
- b. Based on 878 samples
- c. Based on 992 samples
- d. EV denotes Equal Variances

Bootstrapping results from the SPSS output demonstrates that there were instances of significant difference in performance based on category between 2017 and 2018. Of the ten categories of questions presented to the students, there were four categories where there was a significant difference in performance from one year to the next. These categories are presented below:

Table 11.

2017 vs. 2018 Categories of Significant Difference		
Question Categories		Sig. (2-tailed)
Carriage Requirements	EV not assumed	.05
Unique Encounters	EV not assumed	.03
Abandoned Boats	EV not assumed	.02
Mandatory Education	EV not assumed	.04^c

Note. Presented are the four survey category questions with significant t-test results after bootstrapping. (Carriage Requirements, Unique Encounters, Abandoned Boats and Mandatory Education). Significant values are p-values < or = to 0.05. P-values are located under the “Sig. (2-tailed)” column.

- a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples.
- b. Based on 878 samples
- c. Based on 992 samples

Of the three categories presented here, the 2017 year outperformed the 2018 group in only one category (UNQE_EN = unique encounters). The 2018 group outperformed the 2017 group on all three of the other topic areas. These four different question categories cover different material presented in the course. Carriage Requirements discussed content related to what equipment is required aboard certain watercraft. Unique Encounters covered different procedural protocol officers were expected to know relating to conducting investigations on the water. The Abandoned Boats section focused specifically on the training and knowledge needed to deal with and address abandoned boats throughout Oregon’s waterways. Finally, the Mandatory Education section discussed the educational requirements that all recreational boaters must obtain when boating in Oregon. Table 12. (below) shows the average scores on each topic of the four categories analyzed.

Table 12.

	2017 vs. 2018 Significant Categories and Average Scores			
	Carriage Requirements	Unique Encounters	Abandoned Boats	Mandatory Education
2017 e-Learning	0.75	0.85	0.84	0.91
2018 Classroom	0.83	0.74	0.97	1.00

Note. Table presents the mean scores for each of the four significant survey category questions from 2017 (e-Learning) and 2018 (Classroom). The 2018 (Classroom) year had higher means scores for three out of the four survey categories (Carriage Requirements, Abandoned Boats, and Mandatory Education). The 2017 (e-Learning) year had a higher mean score on one category (Unique Encounters).

3.1.2 Interactivity

In addition to the capacity for retention, interactivity was another dominant over-arching theme, related to the classroom, identified throughout the interview process in both groups. MLEA officers in training and facilitators (instructors and OSMB staff) alike made clear that interactivity as a critical component to the training and development of marine deputies. The following sub-sections highlight specific areas where interactivity can play an important role in the MLEA training process.

Repeated, Hands-on Exposure to Material:

Research participants explained that what specifically makes the traditional or classroom environment more conducive to learning was interactivity throughout the training process. Officers identified face-to-face training, providing officers opportunity to directly practice skills related to their job as important for this learning style. For many, hands-on training was what helped them better understand the content being discussed. This need was expressed in student comments:

For me, for most people you start seeing things multiple times and, then that's when you start to grasp it.

In addition to the importance placed on the role of the instructors and the opportunity for interactivity in the classroom, the interview subjects also conveyed the importance of the practical and tangible aspects of the training, such as in boat-handling. This makes sense, because although an officer can learn and understand every rule and regulation associated with boating and other maritime law, that officer will also need to be able to maneuver a boat in an efficient, safe and effective manner. This was such a central topic that only 2 of the 13 interviews covered did not mention the importance of the boat handling.

Once we learn it we don't really forget it. It might get a little rusty if you haven't done something for a year. But I would feel comfortable right now going down the Deschutes on a drift boat and I haven't used a drift boat since drift boat school. That's how comfortable I am from what they taught me.

This highlights that while the content aspects of the training are important, some practice of the practical portions of the training such as how to operate a boat are central to the participants perception of MLEA training.

Instructor Passion and Delivery:

Instructors shared their perspectives on interactivity in training marine deputies. They made references to their approaches to teaching that added to the quality of interactive training. For example, they described techniques they could use in a classroom format to better target those who are not as focused and need extra attention. Instructors noted that when teaching you have to be able to work with the previous experiences of other officers who are attending the academy and may have an idea about how something should be done. These instructors believed the instructor needs to recognize the officers' different ways of approaching problem solving, but at the same time teach them how it is done at the academy. A final repeated idea in the interviews relating to their teaching approaches was an instructor's capacity to be passionate. According to these instructors, a passionate instructor can really add to student engagement. One instructor commented on this approach to teaching with passion:

When you're doing it and presenting it in a way that gets them to be able to execute the mission in the way that we're wanting it done, and you're able to show that with some kind of passion and with some kind of intent, then that gets them more onboard. It invests them in what it is that you're doing and why you're doing it

Every interviewed instructor emphasized the importance of the classroom-based instruction and its value in teaching marine law enforcement.

Interactivity, hands-on learning, and opportunity for questions and dialogue were all components of the ideas shared across these interviews. Both specifics on the potential benefits of classroom-based education and more general perceptions were offered, as in the remarks from the instructor:

I have helped put together online courses, and I have taught many in-class courses. I have also attended many classroom courses and worked on a lot of online training

courses that I had to do. You know, I can tell you, people take away a lot more sitting in a classroom.

Interactivity was probably the biggest theme instructors expressed regarding ideas about the benefits of classroom and experiential learning. For many, hands-on learning was an essential part of instruction in both academy weeks so that officers could apply the content they are learning in real time. In fact, many instructors felt application was what really solidifies the learning process, and application comes from hands-on or experiential learning such as breakout sessions, passing around props like PFDs (personal flotation devices), and boat handling. Others echoed this idea but noted that hands-on training was important also because it is an inherent element of the officers' duties throughout their career. Officers are always learning and need opportunities to apply new knowledge to real world situations.

Engagement with Instructor:

One of the underlying factors contributing to these preferences for classroom or in-person training relates to the role the instructor plays in the education process beyond passionate instruction. Many of the research participants described the essential role the instructor can play in creating an environment conducive for learning. Many research participants spoke to the years of work-related experience the instructors bring to the MLEA and how that makes them valued. Many provided examples of how they have appreciated their instructors' real-world experience as a positive addition to their training:

I think the biggest thing for me for the academy is just having those guys with experience, with multiple years of experience...

And when live instruction was not there, because of the online format, others shared:

I mean, just having the ability to pick those guys' brains while the information is being presented would have been more helpful.

Participants also find essential the instructor's ability to provide real time feedback to questions posed in the classroom. Allowing open dialogue in the classroom encourages questions to be raised, and allows officers to work with each other and with instructors to figure out answers to material that was not clear to them initially. Asking those questions is not

only important for officers so they can receive immediate feedback, but it can also assist in their understanding of broader concepts:

Then, when we actually got there to the academy that's where I really started to, I don't know, piece it together and learn how it would be used doing my job effectively. Because when you're there, you're actually able to speak to the instructors and getting that one-on-one time with them.

Instructors also remarked on the importance for engagement of students with the instructor. Components of interactivity facilitated by classroom instruction, according to instructors, included the ability for officers to ask questions or engage in dialogue with either fellow students or with instructors themselves to pose questions and find answers. Instructors emphasized the necessity for students to be able to ask questions when concepts were not clear. According to instructors, answers to questions did not have to necessarily come from the instructors themselves but could come through interaction with fellow students. Additionally, noted by the instructors was the collaborative environment of the classroom that can facilitate these types of interactions. As it related to interactivity, instructors discussed how interaction with instructors in a face-to-face environment could allow for instructors to serve as a motivating force for students to focus and learn.

At least in a classroom you can, as an instructor, kind of target that individual that you know wasn't paying attention. You can make sure that you drive home the point to that individual that they need to be focusing a bit more than what they are; take the course a bit more seriously.

In this way, these teachers can act as motivators for students by focusing their instruction to target those who are struggling or are not as engaged.

All these comments express the need for a face-to-face role in officer training. From the perspective of the instructors, there is real value in the classroom-based and experiential learning that has been a tradition at the academy.

Comradery:

A final component of interactivity mentioned by both interview groups related to comradery. The MLEA is the first opportunity for officers to meet and make connections with

the other soon-to-be marine deputies throughout the state. One MLEA participant discussed the relative importance of comradery when sharing comments about online training instead of face-to-face training:

I think you also missed out on the comradery with other classmates. There are people you don't know but you want to get to know because you're in the same profession and you have the same common interests. We missed out on that when you just sit in front of a computer typing away.

The above comment notes that interactivity amongst participants adds value to the overall experience of the academy. Another officer shared that this comradery not only is added value for the sake of interaction but also can have implications for the future careers of these deputies.

There's like 36 counties here in the state of Oregon. Most of us don't know each other at all and when you attend the classroom portion for the week, you're getting to know everybody and you get to be able to lean on those folks now down the road. So, if you have an incident or you have a question, you're not afraid to pick up the phone and call them. You know these individuals now. So, that type of comradery is also extremely important.

Officer and instructor interviews reflect how classroom-based, hands-on, and experiential learning is an important factor in training marine deputies.

3.2 E-Learning

Interviews with officers regarding training at the MLEA in general also lead to insights about the classroom experience and perceptions of e-Learning specifically. Several different themes emerged regarding e-Learning, from cost effectiveness and the direction of e-Learning, to blended learning options, self-pacing, and a lack of interactivity. Others identified e-Learning's practicality as a benefit in that it allows students from all over the state to receive education and training at the same time. This opportunity works in conjunction with cost-saving potential and forms the basis for e-Learning benefits in distance education.

3.2.1 Lack of interactivity

A majority of officers and instructors expressed the challenges and dissatisfaction they experienced with e-Learning. The officers' dissatisfaction centered on the actual content of the

online learning, and the limitations of e-Learning as an actual teaching tool. For many, there were developmental issues with the final product of the e-Learning program itself. Online content delivery was not helpful to officer learning and was often confusing to many. It was described as “full of holes and lacking interactive components that left more questions than answers.” One student remarked on the quality of the online training:

I think the biggest thing is that a lot of it was simply the PowerPoints that had been used previously. But it was just the PowerPoint; there was nothing to back it up. So, when you look at a PowerPoint with just bullet points with no explanation behind it, it was tough to try to figure out what I was supposed to be learning from those bullet points.

Other factors regarding the dissatisfaction with online content related to a lack of examples and interactivity, especially as it related to examples to clarify content.

Some officers brought up issues with e-Learning and pacing. For some, the ability to click-through slides on the e-Learning presentation was detrimental to their learning experience. These officers observed that they were able to complete a week-long course in less than two days, or in just hours, because they would simply click through the slides. Other issues described with pacing had to do with the difficulty of carving out time during their workweek to dedicate to the e-Learning training. The ability to pace was identified across interviews as an important factor in online training, and in training in general.

As a teaching tool, e-Learning was found to be a challenge to the officers’ preferred learning style; some shared that they simply “preferred alternative methods” of instruction to e-Learning. More specifically, officers identified difficulties in recalling content when taught via an e-Learning platform. For many the sheer volume of content presented online was too much for them to fully absorb. Others shared that they were not able to apply the concepts at the same time they were being presented, and thus they were not able to retain the information. The following quote illustrates this:

You say to yourself, “Okay, I know how to do this” and then you go through it. And then you go, “Now, I will take a test and I will pass, but I will not retain it.” Not everybody’s the type of person that can just look online.

Instructors expressed ideas similar to those of the officer participants regarding e-Learning's lack of interaction. Instructors acknowledged that e-Learning is not the preferred method of learning for many officers, and this could be a barrier to any e-Learning success. Multiple instructors characterized common student learning types, stating that the "mentality" of officers is shared amongst most officers and is in line with "more hands-on" experiential learning. Two quotes touch on this:

Most of the people in this are type A personality types, mostly hands-on personality types, and that's the way that they're motivated and engaged.

A lot of folks learn better in an environment that is more hands-on or class-related, especially when you're dealing with law enforcement individuals.

Learning styles aside, one of the instructors' more popular perspectives related to a "dissatisfaction with how the e-Learning program in 2017 underprepared students for the second week of the academy," and after when they left the academy and went to apply their knowledge and skills to their home agencies. Instructors specifically remarked on how, in comparison to previous years, the 2017 e-Learning academy did not prepare the students to retain the training content.

I went through the online portion myself this year just to give it a shot. I don't think it necessarily was able to drive home some of the more important points in which you can show more via hands-on and have that interaction.

Many instructors agreed that the e-Learning format did not create opportunities for officers to engage in conversation when content was not clear or to simply discuss content with peers and instructors for deeper understanding of content: "The classroom environment allows for discussion between the instructor and student but you cannot talk to a computer." Finally, for some instructors the ability to motivate an officer diminished with e-Learning because "officers are not as engaged or only participate in e-Learning because of its requirements, and they try to complete it as soon as possible." Another quote highlights motivation and engaging the learner:

Getting them invested like that, in the beginning, is the whole point. It is a little bit harder through an online medium to get people to get it / buy-in like that.

3.2.2 Cost-Effectiveness

The negatives associated with e-Learning were well documented through the interview process. The following sections discuss perspectives on the opportunities e-Learning can provide. Officers articulated their perceptions of why there might be a move to online learning in their field. The OSMB puts on the training for the academy participants, and this can be a fiscal strain to the agency. E-Learning can provide opportunities to reduce cost by removing the requirement to pay for lodging, travel, event space, and per diem for instructors. Officers recognized this cost saving potential that e-Learning could provide. One officer summed up this point and the ideas expressed by others:

You've got to put them in lodging, you've got to feed them, you've got to get the boats up here and all that stuff so I can understand that part of it and everyone is trying to save money, wherever you're at...doesn't matter what profession it is. So, in it you can streamline somethings by doing it that way.

The theme of cost savings also emerged from interviews with the instructors. Instructors are very aware of the costs associated with developing and hosting the academy. They recognized that e-Learning allows agencies to free-up funds that can be redistributed elsewhere within the marine law enforcement division for things such as additional trainings or new boat purchases.

I do understand the one positive of the online component would potentially be a cost savings and that is good because it does allow you to allocate moneys towards maybe additional advanced training. Maybe towards vessels or whatever it is that you need to get your job done.

Others remarked on the restrictive nature of state government, noting that money can only go so far and that often government agencies are looking to cut costs where appropriate. The notion of cutting costs to improve the overall efficiency and function of marine law enforcement training was also shared:

Cost savings was a part of it. Not to save costs for the sake of saving costs but for reinvestment elsewhere in the training program. That is an important distinction because it was relayed otherwise to a lot of people out there. We were just trying to cut costs. No. We were trying to be more efficient. So, efficiency I guess.

3.2.3 A Trend Towards E-Learning

The perspective of several officers was that there is applicability for e-Learning, since it is where training is heading in contemporary education. Officers acknowledged that this move towards e-Learning would be a component of training in the future, regardless of one's own training preference:

Well, I think a lot of the things we do these days are going that direction.

Instructors noted the future direction of e-Learning in the workplace, with one instructor commenting that it appeared e-Learning is “where industry and agencies are going anyway.”

3.2.4 Blended/Refresher Courses and e-Learning Enhancement

E-Learning does not necessarily have to stand alone. Officers posed ideas for e-Learning application in blended-learning approaches, discussing potential useful opportunities for combining e-Learning with face-to-face instruction as a way to enhance or complement the training process:

Maybe working in junction with each other. To me, something like that would be a better way to spend time and still get the information across; getting the best of both worlds. Not only the straight information from the online portion of it, but also talking with instructors. You could see who's been there, done that, and get their perspective on things. You know, their stories of how they've approached certain things.

Instructors were divided on whether e-Learning could better incorporate interactivity through blended training options. Some instructors still contended that e-Learning could not really facilitate an adequate level of interactivity needed for this type of training. However, other instructors believed that e-Learning could incorporate elements to keep the learner more engaged, such as videos or functions that prevented officers from clicking through content too quickly:

I have seen some of the online courses that require specific responses and you have to click on a button or a tab before you proceed. There are certain online courses that force (the learner) to actually read it and pay attention. Then there are some of them that just kind of let you read it and say “yea, I understand”. So, I think if it’s a structured course that forces you to do certain things to ensure you’re paying attention and not just skip through it too quickly, that could be ok.

Other aspects of e-Learning applicability officers mentioned included how age differences might play a role in law enforcement e-Learning. Both students and instructors noted that younger officers may comprise a demographic more accepting of online approaches to training, whereas older officers may not. Older officers may not be as familiar with education technology formats, and this can create a frustrating environment before the learning process even takes place. On the other hand, younger officers may already have years of exposure to online learning platforms and this experience may lead to more e-Learning acceptance or preferences.

Lastly, in terms of e-Learning applicability, multiple officers emphasized the utility in e-Learning training in a “course refresher” approach. Given that there are so many rules and regulations to remember, and some officers work in marine enforcement only seasonally, refresher courses for MLEA content could prove to be an approach to keep officers up-to-date and refreshed on content they need to know.

Using e-Learning for refresher courses was also a popular idea expressed in the instructor and OSMB staff interviews. For many officers, it can be years since they received formal marine training at the academy. Instructors and OSMB staff recognized the potential utility for refresher courses, sharing that e-Learning could improve officer performance by either mandating or offering refresher courses on content they may be struggling with or have not referred to in a while. One suggestion was that refresher courses be required for marine deputies every certain number of years.

If you are having problems with a particular employee and you really need them to go through it again and take another look at it, that would be a good tool for that as well.

3.2.5 Self-pacing and e-Learning

As to e-Learning platform functionality and presentation, some students enjoyed the self-pacing opportunities in contrast to those who opposed it:

It would take a couple, three or four full days of being in a classroom trying to go over it all that way. So, you know, this way, you know you had enough time. You could break it up into segments and do a couple courses here and there. So, it wasn't all crammed into one short period of time. So, even though there seemed like a lot of content, it wasn't that bad because you didn't have to do it all at once.

Others remarked that the presentation of the online material was straightforward and technically, was easy to operate in a user-friendly way. Multiple officers described the positives they associated with e-Learning as an instructional tool. For example, some spoke to the ability to recall content from e-Learning. Others found the e-Learning approach to training related well to their preferred learning styles. For some, content is grasped and retained better through online platforms than in classroom environments:

I found the process to be, for my learning preference, more useful to me than if I were to have taken the information in a lecture form. I know that we all learn differently but my ability to just be able to read and try to absorb the information, was better for my type of learning I guess.

Instructors, however, were less receptive to the idea of students having that sort of control and expressed concern with the outcome of student-driven, self-pacing in 2017. In the past, the content instruction portion of the academy took nearly four days. The comparison of days to hours was a shocking revelation to some of these instructors, as one states:

The average is one and a half days to do what we would do in four days in the classroom. So, take that into consideration when you talk about how much knowledge does somebody actually absorb when they have four days in the classroom versus what they flipped through on an online course in day and a half. What's their knowledge retention at the end of it?

Overall, the student positive associations with e-Learning reflect the minority perspectives of all MLEA participants in the interviews. The majority perception focused on the negatives and challenges associated with the e-Learning platform in 2017.

3.3 Application of Material to the Job

3.3.1 Describing the job

Marine deputies throughout the state of Oregon conduct law enforcement throughout all of Oregon's boating waterways. These include all the lakes, rivers, bays, estuaries, and the coastal ocean. The demands of a marine deputy are inherently different from those of an officer whose focus is off the water. This difference is, in part, what necessitates the need for marine deputies to receive specialized training. For example, there are many practical examples of how the nature of a marine deputy presents unique challenges. Research participants frequently described the nature of their jobs when reflecting on how the training impacted their ability to apply skills and knowledge to their first experiences as marine deputies. During the course of the interviews many officers made note of the difficulties operating a vessel can create while trying to enforce maritime law at the same time. Moving water and river currents can create a tactical challenge for officers wishing to make boating stops to either conduct investigations or simply speak to someone out on the water. Additionally, another factor to consider when maneuvering a vessel on the water is the public's property. Officers expressed concern that when maneuvering a boat to make contacts they would need to take care in approaching another boat to avoid collisions, given that some boats can be quite expensive:

I guess one of the biggest things is how to approach them. Are they on shore? Are they in another boat, and if they're in another boat, how are you going to approach them?

Beyond some of the tactical aspects of the job, officers have to be on the constant look out for violations of the law. The number and types of laws related to boating and other maritime activities are numerous and quite different from violations that would occur on land. Safe boating procedures, carriage requirements, registration, and Aquatic Invasive Species (AIS) are all areas of maritime law that marine deputies have to be aware of. What complicates matters more for some officers is that they are also apart of OSP's Fish and Wildlife Division. This means that for these deputies, in addition to remembering all of their MLEA training, they need to be able to recall all the rules and regulations associated with ODFW. This can make the amount of knowledge to retain particularly cumbersome for an OSP trooper:

I think one aspect that's a little bit different than I think a lot of other marine enforcement officers have is that we're primarily guided towards that fish and wildlife aspect. I have a whole other realm of regulation and policy that I have to learn on top [of] the marine enforcement. So, doing those contacts, it's a fine line of balancing the fish and wildlife aspect as well as the marine enforcement as well.

Another component of the job discussed in the interviews included an emphasis on agency priorities such as enforcement versus education. While some officers suggested that the OSMB is out to meet a certain number of citations per region over a period of time, others found that citations were not always the top priority in marine enforcement. Reasons shared for an “education-first approach” included some marine deputies not wanting to give their agency a bad name out on the water, as this can make boat contacts more difficult in the long term. According to some of the research participants, if an agency becomes known for always handing out citations, public boaters may be less likely to comply with requests for boat contacts. Reasons for education over citation also can come from an attempt to inform the public and give them opportunity to correct certain behaviors. Officers can have a genuine concern for public safety and simply want to give people the opportunity to learn:

The difference is in my area there's little enforcement action; if that makes sense. I mean, out here we're trying to educate rather than just lay down the hammer.

Lastly, officers touched on the fact that having an ability to communicate effectively was central to being able to conduct oneself as a marine officer. Many saw simple communication as an important strategy to make successful personal contacts. Officers come in contact with many people during their patrols on a daily basis, and the attitude of people they encounter can range from pleasant and compliant to irritated and hostile. Therefore, having an ability to communicate effectively with all different types of people is an advantage. Other officers said they simply enjoy the opportunities for frequent communication with the public.

3.3.2 Content Application to Area of Operation

The interviews highlighted how officers apply their training to their areas of operation (where the officers work). The areas of operation for deputies can be very different regarding the types of boating waterways in one part of the state compared to another. The OSMB,

however, provides statewide training to address all these different areas of operation in one academy. This variability in content along with how the training prepared deputies for boat handling were ideas discussed across interviews when prompted about their first boating season after the training.

The overall goal of the MLEA is to train officers for their professional job duties on the water. In discussing their ability to apply this knowledge and training, multiple officers shared that the content presented at the academy did not have universal applicability to their waterways. For some, the content was simply not relevant to the type of work they would encounter, and thus training in that area was not essential for them:

So, all of the rules and regulations of the marine board covering coastal matters, I have no coastal waters and I don't care about "red-right-return". That doesn't impact me. So, our focus goes way down to just a little piece of all the stuff that is taught there.

Officers described their levels of experience with boating prior to the academy, as this can have an impact on their experience attending the academy. Those with prior boating experience will have a different perspective from those who have no prior training. As it turned out, the officers attending the academy arrived with varying levels of experience and exposure to boating, both in terms of personal experience and prior marine enforcement. For some, their boating experience was minimal to none at all; this was a completely new experience, and they had a lot more to learn in the same amount of time as others with more experience. Other officers not only had personal experience with boating, such as fishing or recreational boating, but also received marine enforcement training from their agencies prior to attending the academy.

Regardless of training or experience ahead of the academy, many officers were cognizant of the fact that training can only take an officer so far:

There's nothing you can do to prepare somebody for every situation that they're going to encounter

3.3.3 Practice Is important

A challenge posed to officers when applying their training to their first enforcement season was their ability to recall content regarding rules and regulations and what constituted a violation. Research participants shared that after getting some real-world exposure after the academy, they were not always clear about the specifics of what constituted a violation. At times officers would suspect that something they observed was a violation but were not sure specifically what violation a boater may or may not have committed:

There were several times throughout the summer where I saw something on the water, behavior or driving, that I knew was a violation of the law. But I would sit down and I would open up the Marine Board law book, or go online or whatever the case may be, and I could not figure out what specific ORS addressed what I was seeing and how to then cite that person or what I would cite that person under.

This challenge specifically relates to the topic of content retention. Many officers at some point during their first season as a marine deputy encountered challenges recalling specific content presented. In addition, more than half the officers interviewed identified areas where they might still need more practice or where they could still improve. Specific areas ranged from boat handling and field sobriety testing to recalling requirements for boater registration and boat accident investigation protocol. Officers recognized a more long-term need for practice and improvement:

I still need practice on all of it. I mean, I'll always need practice on all of it. I'm never going to get to the point where I'm thinking that I'm perfect at it and I don't need any practice. I still need practice on my boat handling skills. I still need practice on marine laws and things like that.

Several officers noted their successes after having completed one boating season. Some noted they had made significant progress in boat handling over the course of the summer. This theme of progressing in skill level was expressed in other areas across interviews as well. For some, the content relating to what constituted a violation was not a major issue, and in fact, they identified an improved familiarity with the laws by the end of the summer resulting from frequent boat contacts creating practice opportunities. For example, one officer reflected on familiarity with content when making contacts with recreational fishermen:

If we're checking a boat or a fisherman or something like that, a lot of times we'll also do safety checks for life jackets, fire extinguisher and all of that kind of stuff. I think that I've got that down pretty well where I don't need a lot of refresher on that.

What came up as a sub-theme between improvements in boat handling and content retention was how repeated exposure and practice added to the officer's comfort and perception of acquiring that skill. This sub-theme of practice and repetition demonstrated the importance of applying skills to marine enforcement.

3.4 Discussion

Retention:

In general, both officer and instructor research participants indicated that the classroom environment would be more conducive to the learning styles of marine deputies and would facilitate better retention. However, the outcomes of the survey data that tested student retention levels on average showed no significant difference in overall test performance between groups. This aligns with other studies showing e-Learning is a teaching approach that can yield equitable retention when compared to classrooms (Schmeeckle, 2003).

At the surface, these results can indicate that e-Learning can be as effective as classroom learning in terms of retention. When investigating further, however, variation amongst officer-type and significant performance differences on a topic-by-topic basis were discovered. Of the four significant difference findings, three were attributed to higher retention within the classroom, whereas one was attributed to higher retention with e-Learning. This does indicate that, at least on a topic level, e-Learning can yield improved performance in certain circumstances. This is not a new finding, as Pourghazneinet al., (2015) indicated that e-Learning retention can at times be greater than from traditional formats such as lectures.

It is important to note that there could be additional variables impacting the extent of student retention. Torun and Altun (2014) acknowledged that an individual's cognitive capability in addition to their preferred learning method can limit a student's capacity to retain information. Additionally, Sahasrabudhe and Kanungo (2014) explain how a student's level of

computer self-efficacy can also contribute to variations in information retention. These sorts of barriers identified in the literature could have been encountered throughout this study as well.

Interactivity:

Interactivity was one of the most prevalent themes coming out of the research. For the majority, the classroom environment, where there is face-to-face interaction, was perceived to have the essential elements of interactivity identified by participants and instructors. When reflecting on their MLEA experience, interviewees emphasized what they perceived to be the core elements of training: The ability to ask questions, have dialogue, be taught in an engaging way, and enjoy the comradery of fellow students were all central to the positive perceptions of interactivity. What was interesting is that these positive associations with interactivity came in reference to the classroom and not the e-Learning environment. Instead, when addressing e-Learning directly, the majority perspective of both officers and instructors was that the e-Learning program designed and used in 2017 was lacking in interactivity. The cumulative perspective clearly highlights that in this “pilot year” of the e-Learning program, the training did not meet the interactivity requirements of both participants and MLEA facilitators. While it has been noted in the literature that there is concern that e-Learning can promote a lack of interpersonal skills (Leal, 2009), others note that e-Learning, if developed properly, can be just as engaging as traditional modes of instruction (Arshavskiy, 2013). The choice of media is important in e-Learning design as it can impact educational results and enhance learner concentration (Ilgaz, et al. 2014; Liu, et al. 2009). Chen, et al. (2010) however, emphasized the importance of interactivity in e-Learning environments noting that it is essential in order to meet educational goals and instructional effectiveness.

Cost-Effectiveness:

Both negative and positive potentials associated with e-Learning program were identified. MLEA cost savings created by e-Learning was noted as a potential positive. Both MLEA participants and facilitators understood that reducing costs is always a positive as long as it does not sacrifice training quality. This is not a unique finding. Many studies have already

indicated the cost saving potential that e-Learning can provide for those participating in and facilitating the training (Desai et al., 2006; Leal, 2009; Schmeeckle, 2003). The OSMB is the state agency responsible for providing this training, and the OSMB staff certainly noted as well the benefits of cost savings associated with e-Learning. This opportunity was a motivation for the OSMB to experiment with this learning format in the first place. Every other group interviewed demonstrated broad level acceptance and agreement that e-Learning could reduce costs.

Trends Towards e-Learning:

Although many MLEA participants and facilitators may be reluctant to embrace e-Learning, at least in the format used in 2017, they also acknowledged a broad scale trend to move towards more contemporary forms of training. The perception was that of a reluctant embrace of online training. While the majority expressed a preference for the classroom, they discussed how they could see realistically that classroom-based training may not be an option in the future. This aligns with much of the literature that discusses e-Learning's rapid growth in popularity and utility in academic and professional environments (Desai et al., 2006).

e-Learning and Self-Regulated Pacing:

One of the attractions of e-Learning described in the literature refers to e-Learning's capability for self-paced education (Desai et al., 2006). This was also a finding discovered through this research. The majority of MLEA participants said self-paced education was an e-Learning benefit. The participants have busy schedules, so having the option to learn at one's own pace was very attractive, even among those who preferred the classroom. E-Learning in both asynchronous and synchronous formats, as well as hybrid versions of these two, have been shown to be more effective training options compared to non-hybrid training alternatives (Chen, et al. 2010). These self-paced training approaches offer benefits to learners. Hrastinski, et al. (2010) demonstrated that synchronous e-Learning formats are better options for promoting interactivity amongst learners. It has also been shown that asynchronous formats are better suited to promote deeper thinking and reflection for students (C. C. Robinson & Hullinger, 2008). Instructors, on the other hand, did not agree with this finding; they were

concerned that officers could move through the content too quickly and not absorb it effectively. Their perception was different from that of much of the literature on e-Learning and self-pacing.

E-Learning Enhancement:

Although this study found overwhelming preference for interactivity in training, especially as it related to classroom-based instruction, marine deputies also saw opportunity in e-Learning to engage them in the MLEA training process. Instructors and officers alike noted that e-Learning could incorporate various aspects of technical improvement and interactivity into the online platform. E-Learning could potentially address some of the concerns articulated about the importance of interactivity in training, as well as provide opportunity for refresher courses. Interactivity in online learning has been acknowledged as critical to facilitate effective education (Chen, et al. 2010). Refresher courses may then better serve future MLEA students if interactivity can be appropriately addressed.

Interviewees specifically noted where technical improvements could be made to the e-Learning program that could improve both the overall functionality and quality of instruction. This finding relates to those identified in other studies, such as Schmeckle (2003) who noted many forms of instruction that incorporate multimedia have been shown to be successful. Leal (2009) also notes that these engaging forms of online learning can be received well by the students taking the courses. Taking the time to choose appropriate forms of audio and video media to enhance the learner experience can facilitate achieving learning outcomes (Sahasrabudhe and Kanungo, 2014).

Application:

While officers demonstrated their levels of retention, another narrative uncovered during the interviews about the 2017 academy experience was the importance of marine deputies being able to apply content to their job. Upon further investigation, deputies would first discuss what was involved in their daily duties after having completed their first boating season. Then, reflecting on their training in the context of applying their knowledge to the job

over time, many discussed how the content presented at the academy was at times excessive; not everything had immediate relatability to the area where these officers worked. Officers need to be able to apply the content they learn, and this is in alignment with previous research (Schmееckle; 2003) that noted the application of knowledge is the goal of most instruction, and knowledge application can be critical in promoting learning at a deeper level.

The role of practice was central to the marine deputies' ability to apply content to their job. The ability to practice law and regulation recall was of particular importance. Boat handling practice was also identified as central to the future development of marine deputies as they move through their careers. These points further add to the literature about applying content through practice to enhance the development and training of an officer, an idea supported by Giovenго (2017). In fact, this practice and instruction allowed officers to recognize their areas of progression in skill development to a point where they felt they were excelling on the job.

Chapter 4: Conclusion

Officers Need Training:

The data gathered in this research provide informative lessons. Officers attending the MLEA need to acquire a lot of knowledge and skills, and this need goes on beyond the academy training, because skill development and improvement are continuous requirements throughout their careers as marine deputies. MLEA training is central to their initial development. Officers, instructors, and OSMB staff alike all understand that academy training has to be delivered in a way that ultimately best prepares these officers for the duties of their jobs. State-level training must then be broad enough to address the many different marine environments that characterize Oregon.

Classroom instruction and e-Learning can both function as competitive options for enhancing officer retention. This case study demonstrated that e-Learning can meet certain educational objectives as compared to classroom instruction. The OSMB has used the classroom environment for instruction as the standard in the past; however, the OSMB felt a need to experiment with an alternative approach. As a result, fruitful insights from this research emphasize important aspects of training that should not be sacrificed.

The online platform did not meet the essential interaction requirements or technical requirements articulated by either MLEA participants or facilitators. With a classroom cohort and an e-Learning cohort displaying similar levels of retention and recall, *is there an avenue where e-Learning and the classroom can be used in conjunction to maximize the training benefit for the OSMB and academy participants?* This was an idea posed by multiple interviews. It would appear from the data that although e-Learning may not be an instructional preference, technical and interactive improvements in course design could potentially yield improved acceptance of online platforms in future MLEA years.

How does this translate to a decision from management? There is a trend towards e-Learning, and it can certainly provide options for consistent instruction, self-paced learning, and fiscal relief to agencies. However, it would appear that other factors must be considered, such as the various components of interactivity crucial for marine law enforcement training. *How*

then can management agencies determine what elements of e-Learning design, development, and implementation are the most important to consider? This is an area for future research to explore.

Future Research:

While considerable literature exists regarding e-Learning in law enforcement, there is still more to be understood about improving e-Learning for training law enforcement. Marine law enforcement is an even narrower field and needs particular attention. Marine law enforcement does not end with boating enforcement in the Pacific Northwest. As mentioned in the Introduction, there are other agencies devoted to maritime law enforcement that tackle aspects of fishing, shipping, and national security. It is therefore prudent that research continues to investigate where, how, and in what context marine law enforcement training is making progress. E-Learning, when designed to have multiple interactive components, can be used to complement face-to-face instruction. Synchronous e-Learning for example can bridge social gaps by having instructors available live online through different platforms such as Skype or WebEx.

Additionally, an emphasis on design is important when developing online training unique to officers in the marine environment. The design stage in e-Learning development can function to improve perception and retention (Chen et al., 2010). Certainly, there is much yet to be discovered about the potential balance to be struck in law enforcement training when combining e-Learning with the classroom.

Limitations of this Study:

There were restrictions on this research that limited its ability to go further in depth. Unfortunately, only two years of survey data were gathered, and more surveys related to e-Learning exposure and classroom-based exposure could perhaps refine the significant findings to give a more accurate representation of retention.

The addition of post-academy surveys could have been beneficial to analyze recall over a set time period to better understand how much content officers retained as time progressed

beyond the academy. Having access to the quiz results that the officers took while taking the online course could have added to this information as well. Having this information could further clarify officer performance during the e-Learning process.

Curriculum implementation and development at the agency level could have impacted the results of the study. When the e-Learning course was made available to students online, there was limited or no access to technical or instructional support for students. This could have impacted factors such perception and retention in ways that may or may not have been avoidable, although it is difficult to know for certain. Agency fiscal restraints at the OSMB could have caused these limitations, which can be difficult to avoid.

Lastly, having interviews with the 2018 cohort of MLEA officers, who only received the classroom format, would have been helpful to gather perceptions of that training. Would the prompting questions related to classroom experience lead to a shift to discuss alternate forms of instruction such as e-Learning? It is difficult to say.

Research Implications:

Limitations aside, these results contribute to an analysis of retention and perception of training as impacted by e-Learning. These findings are not only clear but also have utility in their application. The information can prove useful to future learners, the instructors who help with academy facilitation, and the OSMB, who is the agency tasked with hosting the academy. Informing the law enforcement training design and development process through research can enhance the students learning experience by delivering quality training and therefore meet agency educational goals.

Beyond hosting the academy, the OSMB mission includes a responsibility to provide marine law enforcement to Oregon's boating public. The marine law enforcement officers' role is to maintain boater compliance to ensure that everyone is following the rules and not posing any undue risk or harm to the environment or anyone on the water. In this way the OSMB law enforcement division acts as an extension of OSMB managerial authority. The officers are at the interface where the public meets state regulation requirements, and they effectively facilitate

MRM throughout Oregon's lakes, rivers, and coastal waterways. Performing these tasks requires a certain level of knowledge retention and training in general. To best meet the MRM needs of the OSMB, these officers must have training that aligns with the OSMB's training targets and overall agency mission. The findings of this study add to the MRM conversation by discussing some best practices of law enforcement training identified through interviews and surveys.

The OSMB could use the information from this research in multiple ways. Currently the perception of e-Learning in the MLEA is unfavorable, but that does not mean this perspective will endure. If the OSMB wishes to pursue e-Learning as an option for training marine deputies in the future, the interviews and the literature provide options to consider. Given that cost savings is an important consideration for the OSMB and state agencies in general, perhaps the money saved by switching to e-Learning platforms could be used to make e-Learning enhancements. Independently contracting e-Learning design and development with outside organizations could potentially be an effective option for agencies like the OSMB in the future. In e-Learning design, there is a difference between students accepting the e-Learning design and whether the design meets educational goals. Perhaps through an enhanced and collaborative e-Learning design process within the agency itself or through outsourced design and development, e-Learning preference and educational optimization can both be achieved.

These research findings can be useful not only to the OSMB, but also to other NRM agencies involved with law enforcement training or continuing education, regardless of law enforcement affiliation. Whether engaged in land-based law enforcement or marine, taking the time to understand student perceptions as well as agency educational goals can facilitate a more informed training development process.

When it comes to managing the various natural resources of our nation and of our planet, having a competent workforce is a prerequisite to meeting management objectives. The number and types of natural resources that we benefit from are wide ranging. The management of such resources requires agency staff to be prepared and willing to address unique and complex needs, as environmental issues facing our societies today are dynamic and

ever-changing. Professionals in the NRM field will then find it is necessary to identify where improvements in performance and training can be made through continuous inquiry and research.

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Appendices:

Appendix A:

OSMB Marine Law Enforcement Academy 2017 Survey

Please enter your first and last name below:

: _____

Thank you for taking the time to answer each question below. All questions below relate to the online course you participated in before coming the training today. Each module is listed below and followed by questions related to the content in that module.

AIS (Aquatic Invasive Species)

1. All boats, regardless of size, require an aquatic invasive species permit:

- True
 False

2. While underway, each occupant of a 12-foot raft is required to have a:

	True	False
Sound producing device	<input type="radio"/>	<input type="radio"/>
Valid Aquatic Invasive Species (AIS) permit	<input type="radio"/>	<input type="radio"/>
Properly sized, good and serviceable PFD	<input type="radio"/>	<input type="radio"/>

Module 1: Carriage Requirements

3. All boats shall carry aboard:

	True	False
At least, one USCG approved PFD, properly sized and in serviceable condition for each person on board	<input type="radio"/>	<input type="radio"/>
A ventilation system for motorboats using fuel having a flashpoint of only 90 degrees Fahrenheit or less that properly and efficiently ventilates the bilges of every engine and fuel compartment in order to remove any inflammable or explosive gases	<input type="radio"/>	<input type="radio"/>
One B1 fire extinguisher aboard for boats propelled by an outboard motor that does not have a permanently installed gas tank	<input type="radio"/>	<input type="radio"/>
An acceptable means of a backfire flame arrestor for every gasoline engine installed in a motor boat or motor vessel after 1985, including outboard motors	<input type="radio"/>	<input type="radio"/>

4. The Oregon State Marine Board may deny or suspend a boater's title or registration:

- True
- False

5. Commercial vessels are exempt from documentation:

- True
- False

Module 2: Rules of boating operation**6. When encountering a water hazard, which of the following is NOT something you need to consider:**

- Does this hazard need the aid of OSMB or a private contractor for removal?
- Is it something I can safely clear?
- What species of tree is it that fell?
- Is it an actual hazard to navigation?

7. A red light indicates the port side of the vessel:

- True
- False

8. When considering the carrying capacity of a boat, operators should take into consideration the weather and other normal operating conditions:

- True
- False

9. PFD's are not required when operating a personal watercraft (PWC):

- True
- False

10. Navigation lights are required:

- A) Between sunset and sunrise
- B) During periods of restricted visibility
- C) Both A and B

11. Visual Distress Signals (VDS's) should be USCG approved:

- True
- False

12. All vessels at anchor must display a white, all-around light between sunset and sunrise and during periods of restricted visibility

- True
- False

13. An example of "Reckless Operation" could be:

- Damage to boats or injuries caused by wakes
- Excessive speeds in a marked boat launch or marina
- Operating in a marked swimming area with swimmers present
- All of the above

14. The three basic rules of navigation are practice good seamanship, maintain a proper lookout and match your speed with other boaters

- True
- False

15. All of the following are appropriate sound producing devices for a vessel EXCEPT:

- Mechanically efficient device, capable of sustaining a 4-6 second blast
- Whistle audible for at least 1 mile
- Using your fingers as a whistle

16. When two boats are approaching each other head on or nearly so (so as to involve risk of collision), each boat shall bear to the right and pass the other boat on its left side:

- True
- False

17. Liveries renting PWC's are required to do all of the following EXCEPT:

- Not rent to persons under 18 years of age
- Provide a personal operation demonstration to users
- Display a safe operation information decal on each craft
- Provide a copy of state PWC rules

18. PWC operators are not to come within 200 feet directly behind a towed skier:

- True
- False

19. To better know your Area of Responsibility (AOR) when on patrol you should:

	True	False
identify and work areas with high use or known conflict	<input type="radio"/>	<input type="radio"/>
have preplanned patrols	<input type="radio"/>	<input type="radio"/>
shake-up the patrol routine now and again	<input type="radio"/>	<input type="radio"/>

20. Which of the following is not a Class A misdemeanor?

- Fleeing/attempting to elude
- False report of a boat theft
- Especially hazardous condition, (failing to correct)
- HIN removed/concealed

21. "Slow-no wake" means operating a boat at the slowest speeds necessary to maintain steerage and that reduces or eliminates waves that appear as white water behind the boat.

- True
- False

22. It is not permissible to buy, receive, dispose of, sell, offer for sale or possess any boat or component from which the hull identification number assigned to the boat or component identification number has been removed, defaced, covered, altered or destroyed for the purpose of concealing or misrepresenting the identity of the boat or components

- True
- False

Module 3: Officer Procedures

23. The confidential or secondary hull identification number (HIN) is required to be placed where on a boat?

- On the engine
- Near the operator chair
- In a hidden location, permanently attached
- Under the floor
- All of the above

24. When investigating boat accidents, which of the following conditions are likely:

- Lack of skid marks
- Evidence may have sunk or floated away
- Boats tend to travel through or over each other in a collision
- All of the above

25. The operator of a boat involved in an accident must:

	True	False
Take reasonable steps to notify the operator or person in charge of the damage	<input type="radio"/>	<input type="radio"/>
Assist with the injured	<input type="radio"/>	<input type="radio"/>
Provide his or her name, address and boat registration number to those involved in the accident	<input type="radio"/>	<input type="radio"/>
Report to the Marine Board only in the event of death or disappearance	<input type="radio"/>	<input type="radio"/>

26. Marine patrol operations may include

- Foot patrols
- Boat Patrols
- Undercover patrols
- Uniformed patrols
- All of the above

27. The manufacturers identification code (MIC) is found in what portion of a 12-digit hull identification number (HIN)

- Middle three characters
- First three characters
- Last three characters
- None of the above

28. The "steps" of a boating investigation may include all of the following, EXCEPT:

- Secure the scene
- Notify the media
- Assisting the injured
- Collecting evidence

29. Boats manufactured after November 1, 1972 are required to display a 12-digit hull ID number (HIN) in the following location:

- Inboard on the left side of the transom
- Outboard on the upper right side of the transom
- Near the helm station
- Inside the engine compartment

Module 4: Unique Encounters

30. Persons renting a boat from a livery are required to carry the certificate of number (registration) aboard:

- True
- False

31. Which of the following groups meet the definition of an Outfitter Guide?

- A paid hunting guide, guiding on 600 acres he owns
- Whitewater kayak students earning college credit
- A fishing guide on the Metolius River that is paid by his clients
- A non-profit organization

32. The Marine Board may reprimand, suspend, revoke or deny an outfitter guide's registration for up to:

- 3 months
- 9 months
- 24 months
- 12 months
- All of the above

33. A person who acts or offers to act as a guide on any section of water rated class III or higher shall:

- Have PFD's available for all clients
- Have one spare PFD on board
- Require all persons, including guides to wear properly fitting USCG approved PFD's
- Have only children under the age of 12 wear PFD's in class III rapids or above

34. A charter boat designation includes the following:

- Carries 7 or less passengers for hire
- Carries 12 passengers in the ocean only
- Carries 7 or more passengers for hire for angling, sightseeing or recreational purposes
- None of the above

BUII: Boating under the influence of intoxicants

35. What are some of the common effects of alcohol?

- Decreased attention
- Increased reaction time
- Slurred speech
- Blood shot eyes
- All of the above

36. An involuntary, repetitive jerking movement of the eye is called

- Optokinetic eye movement
- Horizontal gaze nystagmus
- Vestibular gaze
- Paroxysmal Vertigo

Electric Shock:

37. As a first responder, your safety is always the most important:

- True
- False

38. Exposure to 1-3 milliamps of stray voltage in the water may cause a tingling sensation:

- True
- False

Case Study:

39. Boating accidents are reportable to the Marine Board when which of the following has occurred?

- Damage to property that exceeds \$2,000
- Death or disappearance
- Injury beyond first aid
- All of the above

40. The "steps" of a boat accident investigation may include all of the following EXCEPT:

- Securing the scene
- Assisting the injured
- Notification of the media
- Collecting evidence
- All of the above

41. A boating accident may have multiple causal factors

- True
- False

Abandoned Boats:

42. Seized derelict boats are generally held for ____ days:

- 30
- 90
- 120
- 14

43. Discharge of human waste, trash or oil overboard from a boat is illegal:

- True
- False

Mandatory Ed:

44. If operating a boat greater than 10HP, boaters are required to have completed an approved boat safety education course AND possess a valid card or temporary permit

- True
- False

45. An 11-year-old child who is water skiing or tubing may wear an inflatable life jacket, as long as it fits properly:

- True
 - False
-

Thank you for continuing to answer the questions below. The following questions will help us to better understand your experience in taking the online course.

Course Expectations:

46. Did the course cover the content you were expecting?

- Yes
 No

Course Structure and Content:

47. Rate your response to the following questions:

	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree
The course adequately explained the knowledge it presented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The course adequately explained the skills it presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The course adequately explained the concepts it presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Quizzing:

48. Did the quizzes at the end of each module appropriately test your understanding of the material presented?

- Yes
 No

Timing:

49. What was the total amount of time you spent to complete this online course?

- 0-2 hours
- 3-4 hours
- 5-6 hours
- 7-8 hours
- 9-10 hours
- More than 11 hours: (Write in the number of hours _____)

50. Did you feel the amount of time it took to complete this course was appropriate for this content?

- Yes
- No
- Not sure

Technical:

51. Rate your response to the following question where:

	1 Extremely Difficult	2 Difficult	3 Easy	4 Extremely Easy
Rate how difficult or easy it was for the course to load	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rate how difficult or easy it was to log in to the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Visual Design:

52. Please rate your response to the following question where:

	1 Extremely Unsatisfactory	2 Unsatisfactory	3 Satisfactory	4 Extremely Satisfactory
Rate the overall aesthetic of the course content and materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Overall Experience:

53. Please rate your response to the following question where:

	1 Extremely Unconfident	2 Unconfident	3 Confident	4 Extremely Confident
Rate how confident you feel about your knowledge of the course content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

54. Identify three ways to improve this online course

-

-

-

Appendix B:

OSMB Marine Law Enforcement Academy 2018 Survey

Please enter your first and last name below:

: _____

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5. Commercial vessels are exempt from documentation:

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- Does this hazard need the aid of OSMB or a private contractor for removal?
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- What species of tree is it that fell?
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- False

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- Damage to boats or injuries caused by wakes
- Excessive speeds in a marked boat launch or marina
- Operating in a marked swimming area with swimmers present
- All of the above

14. The three basic rules of navigation are practice good seamanship, maintain a proper lookout and match your speed with other boaters

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- False

15. All of the following are appropriate sound producing devices for a vessel EXCEPT:

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have preplanned patrols	<input type="radio"/>	<input type="radio"/>
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- False report of a boat theft
- Especially hazardous condition, (failing to correct)
- HIN removed/concealed

21. "Slow-no wake" means operating a boat at the slowest speeds necessary to maintain steerage and that reduces or eliminates waves that appear as white water behind the boat.

- True
- False

22. It is not permissible to buy, receive, dispose of, sell, offer for sale or possess any boat or component from which the hull identification number assigned to the boat or component identification number has been removed, defaced, covered, altered or destroyed for the purpose of concealing or misrepresenting the identity of the boat or components

- True
- False

Officer Procedures:

23. The confidential or secondary hull identification number (HIN) is required to be placed where on a boat?

- On the engine
- Near the operator chair
- In a hidden location, permanently attached
- Under the floor
- All of the above

24. When investigating boat accidents, which of the following conditions are likely:

- Lack of skid marks
- Evidence may have sunk or floated away
- Boats tend to travel through or over each other in a collision
- All of the above

25. The operator of a boat involved in an accident must:

	True	False
Take reasonable steps to notify the operator or person in charge of the damage	<input type="radio"/>	<input type="radio"/>
Assist with the injured	<input type="radio"/>	<input type="radio"/>
Provide his or her name, address and boat registration number to those involved in the accident	<input type="radio"/>	<input type="radio"/>
Report to the Marine Board only in the event of death or disappearance	<input type="radio"/>	<input type="radio"/>

26. Marine patrol operations may include

- Foot patrols
- Boat Patrols
- Undercover patrols
- Uniformed patrols
- All of the above

27. The manufacturers identification code (MIC) is found in what portion of a 12-digit hull identification number (HIN)

- Middle three characters
- First three characters
- Last three characters
- None of the above

28. The "steps" of a boating investigation may include all of the following, EXCEPT:

- Secure the scene
- Notify the media
- Assisting the injured
- Collecting evidence

29. Boats manufactured after November 1, 1972 are required to display a 12-digit hull ID number (HIN) in the following location:

- Inboard on the left side of the transom
- Outboard on the upper right side of the transom
- Near the helm station
- Inside the engine compartment

Unique Encounters:**30. Persons renting a boat from a livery are required to carry the certificate of number (registration) aboard:**

- True
- False

31. Which of the following groups meet the definition of an Outfitter Guide?

- A paid hunting guide, guiding on 600 acres he owns
- Whitewater kayak students earning college credit
- A fishing guide on the Metolius River that is paid by his clients
- A non-profit organization

32. The Marine Board may reprimand, suspend, revoke or deny an outfitter guide's registration for up to:

- 3 months
- 9 months
- 24 months
- 12 months
- All of the above

33. A person who acts or offers to act as a guide on any section of water rated class III or higher shall:

- Have PFD's available for all clients
- Have one spare PFD on board
- Require all persons, including guides to wear properly fitting USCG approved PFD's
- Have only children under the age of 12 wear PFD's in class III rapids or above

34. A charter boat designation includes the following:

- Carries 7 or less passengers for hire
- Carries 12 passengers in the ocean only
- Carries 7 or more passengers for hire for angling, sightseeing or recreational purposes
- None of the above

BUII: Boating under the influence of intoxicants

35. What are some of the common effects of alcohol?

- Decreased attention
- Increased reaction time
- Slurred speech
- Blood shot eyes
- All of the above

36. An involuntary, repetitive jerking movement of the eye is called

- Optokinetic eye movement
- Horizontal gaze nystagmus
- Vestibular gaze
- Paroxysmal Vertigo

Electric Shock:

37. As a first responder, your safety is always the most important:

- True
- False

38. Exposure to 1-3 milliamps of stray voltage in the water may cause a tingling sensation:

- True
- False

Case Study:

39. Boating accidents are reportable to the Marine Board when which of the following has occurred?

- Damage to property that exceeds \$2,000
- Death or disappearance
- Injury beyond first aid
- All of the above

40. The "steps" of a boat accident investigation may include all of the following EXCEPT:

- Securing the scene
- Assisting the injured
- Notification of the media
- Collecting evidence
- All of the above

41. A boating accident may have multiple causal factors

- True
- False

Abandoned Boats:

42. Seized derelict boats are generally held for ___ days:

- 30
- 90
- 120
- 14

43. Discharge of human waste, trash or oil overboard from a boat is illegal:

- True
- False

Mandatory Ed:

44. If operating a boat greater than 10HP, boaters are required to have completed an approved boat safety education course AND possess a valid card or temporary permit

- True
- False

45. An 11-year-old child who is water skiing or tubing may wear an inflatable life jacket, as long as it fits properly:

- True
- False

Thank you for continuing to answer the questions below. The following questions will help us to better understand your experience in taking the classroom-based course.

Course Expectations:

46. Did the course cover the content you were expecting?

- Yes
- No

Course Structure and Content:

47. Rate your response to the following questions:

	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree
The course adequately explained the knowledge it presented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The course adequately explained the skills it presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The course adequately explained the concepts it presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Timing:

48. Did you feel the amount of time it took to complete this course was appropriate for this content?

- Yes
- No
- Not sure

Visual Design:

49. Please rate your response to the following question where:

	1 Extremely Unsatisfactory	2 Unsatisfactory	3 Satisfactory	4 Extremely Satisfactory
Rate the overall aesthetic of the course content and materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Overall Experience:

50. Please rate your response to the following question where:

	1 Extremely Unconfident	2 Unconfident	3 Confident	4 Extremely Confident
Rate how confident you feel about your knowledge of the course content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

51. Identify three ways to improve this classroom-based course

-

-

-

Appendix C:

Verbal Consent for Interviews

Conway&Morrow: OSMB MLEA Study

Thank you for meeting with me today.

Purpose: We are studying the perceptions of those involved in the Marine Law Enforcement Academy. We reached out to you because of your experience in participating in some way with the MLEA and/or supervising someone who has. We would like to include your perspective in our research.

Activities: This interview is focused on understanding the effectiveness of natural resource management agencies providing educational products and programs. The length of the interview is up to you; they generally last anywhere from 30-60 minutes.

Voluntary and Confidential: Your participation in this interview is voluntary and you may refuse to answer any question for any reason. In order to accurately reflect what you share with me, I will be audio recording this interview. You have the option to decline recording at any point in the interview. If the results of this study are published, your identity will not be made public.

Risk / Benefit: There are no possible risks and no direct benefits for participation.

Contact information: If you have any questions about your rights as an interview subject, you may ask now or email me at morrowpe@oregonstate.edu, or contact Flaxen Conway (as the leader; 541-737-1339; fconway@coas.oregonstate.edu), or contact the OSU IRB office at (541) 737-8008 or by email at IRB@oregonstate.edu.

With that said, do you provide your consent to be interviewed for this research?

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With that said, do you provide your consent to be interviewed for this research?

Appendix D:

Interview Guide

Interview guided for each target audience:

2017 MLEA participants (the enforcement officers)

1. Please describe your experience taking the Oregon State Marine Board's first online course as part of the Marine Law Enforcement Academy (MLEA) education program.
2. In what ways did the course and the entire MLEA prepare you for the duties of an enforcement officer?
3. After having completed one 'boating season', in what ways would you describe your first experience working as a marine law enforcement officer?
4. Please describe any areas in job performance or additional practice and/or information that would have been helpful to you in performing your duties.

2017 MLEA Instructors

1. As a MLEA instructor, please describe the knowledge, skills, and abilities you look for in a MLEA student entering into the on-site portion of the academy.
2. In what ways did (or did not) the online course prepare participants for starting the on-site portion of the academy?
3. The first part of the academy has been characterized as "content" focused. As an instructor, what does an "effective" content focused educational program look like to you?
4. What positives and negatives can you see associated with an online educational component for this academy?

Law Enforcement Supervisors

1. Please describe what it has been like to observe marine law enforcement officers that have participated in the online course, participated in the on-site MLEA, and then finished one season of boating enforcement.
2. What are some of the core skills, abilities, and knowledge that you feel that your officers have gained from participating in the academy?
3. In what ways might you describe the positives and negatives associated with an online component for the MLEA?
4. Please describe the overall experiences you have had with dealing with the OSMB delivering educational programs to officers over the years, and if / how this year has been any different?

OSMB Staff

1. Please explain why the OSMB seeks to design and deliver educational programs itself as a way

to prepare enforcement officers.

2. What were the motivations for OSMB to add an online component to the MLEA?
3. Please describe a trained enforcement officer. In other words, what knowledge, skills, and abilities would an officer have to indicate a “thorough understanding” by the time they complete the online course? The onsite portion of the academy? And the combination of the two?
4. Please describe an effective educational program.
5. In what ways might an evaluation of the MLEA be useful for both the Oregon State Marine Board and other natural agencies?