Technology Change Plan

Beyond The Lab

The MarineQuest Virtual Learning Environment

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MARINEQUEST

UNCW

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Introduction

MarineQuest Program Overview

The University of North Carolina at Wilmington has a Youth Programs department called MarineQuest. This unit offers various youth educational opportunities at UNCW with a focus on Marine Science. These opportunities consist of summer camps and school outreach programs, catering to ages from pre-school through pre-college with a curriculum based on an interactive design. The current on site curriculum consists of pre and post lesson assessments, on site sample collection, lab experimentation, data analysis, and discussion. The MarineQuest program offers four academic enrichment programs focusing on the marine science of coastal environments. These programs are classified into two primary categories; on-site and field programs. The outreach programs are designed to bring Marine Science to K-12 students.

The Need and Change Proposal

Research has documented that exposure to the school outreach program increases marine science competency among a diverse population of K-12 students (Tressler, 2008). However, attendance records from Fall 2007 through Fall 2010 indicate a declining enrollment in the on-site and field outreach programs (Appendix G). Data records from the 2007/08 school year indicate 1807 students across grade levels benefited from 25 various curricular programs offered through MarineQuest, whereas the 2008/09 year registered only 786 students attending 19 programs. The 2009/10 academic year saw a slight increase to 21 curricular programs for 941 students; yet further analysis revealed that this increase was attributed to private school participation at a ratio of 2:1 to public school attendance. Previous attendance records indicate a near equal distribution of attendance between private and public school students. Many factors contribute to this declining enrollment, which include increased transportation costs, less grant funding, and budget constraints within public schools.

The challenge for the MarineQuest staff is to identify an alternative method to support the on-site outreach, which will increase participation in the outreach program to be able to positively impact science competency scores and decrease the gender and minority gaps in the marine science field. The proposed technology plan is to design, develop, and support a virtual learning environment (VLE), thus creating the opportunity to continue the high quality outreach of the curricular program and eliminating the barrier of cost for school systems to access the resources of MarineQuest.

The VLE will include modular components of video instruction, sample collection, experimentation, data analysis, and PowerPoint presentations with corresponding lesson plans and activities, mirroring the current on site and field programs experience. Core equipment to begin production of a basic module (Appendixes C and D) is already in place at the MarineQuest facilities, limiting financial investment in the initial stages. The proposed VLE is substantiated by studies which have shown that “teachers who use instructional video report that their students retain more information and understand concepts more rapidly while being more enthusiastic about what they are learning. With video as one component in a thoughtful lesson plan, students often make new connections between curriculum topics, and discover links between these topics and the world outside the classroom” (NTTI, 2006). The proposed technology change presents “a model for teaching and learning with technology to improve the comprehension of key concepts and to support the development of 21st century skills for students” (Hamilton, Duffy 2009) while supporting MarineQuest’s primary goals.

Vision, Mission and Goals

Technology Change Vision Statement

"Bring the ocean to the classroom" - MarineQuest will achieve this statement with a virtual learning environment (VLE) that activates and sustains student interest in marine science. This increase in interest will raise overall science competency, while contributing to growth and diversity in scientific careers.

Technology Change Mission

MarineQuest's mission is to "provide students of all ages the opportunity to further learn, explore, and discover the diverse field of marine science". The virtual learning environment will further increase student access to UNCW research and experimentation through virtual learning modules created in accordance with North Carolina's Standard Course of Study for Science, National Science Standards, UNCW technology policies, state and federal technology standards for students and teachers, and federal standards regarding accessibility (Appendix A). Supplementary support materials will help science teachers incorporate the MarineQuest VLE into their own unit plans to further the competence and comprehension of their students. Continual development of the VLE will deliver open access to a media-rich learning environment.

Technology Change Goals

- Increase participation in MarineQuest Outreach Program
- Increase science competency scores
- Decrease gender and minority gap in marine science field

Technology Change Outputs

- Staff adaptation of current on-site MarineQuest lesson plans to a virtual learning environment
- Network infrastructure necessary to support change in place
- Technical Training of staff in production equipment and peripherals
- Production process supported by a media rich environment
- Fifteen marine science virtual learning modules are available

Implementation Plan

Implementation Overview

The primary goal of the technology change is broader accessibility to MarineQuest's curriculum. This implementation plan will act as a roadmap for achievement of the goals (Appendix H) and projected outputs, outlined by the Implementation Team (Appendix I Figure 3) for the plan's success.

Implementation Strategy

The creation of a virtual learning environment will be supported by a change model which suggests a multi-step approach, viewing the larger project as a series of combined smaller initiatives designated as "quick-wins" (Appendix B Figure 1). The VLE will be implemented via a phased in approach over the course of three years.

Phase 1: Design and Development

Establish a production process to support the virtual learning environment that utilizes available labor and minimizes the purchase of equipment to implement the project initially. Staff will be familiarized and trained on how to adapt the current curriculum for on-line delivery and how to design future lessons supported by a virtual learning environment. Staff will be trained in the use of available production equipment. Training will be conducted by internal personnel to limit cost. The network infrastructure will be assessed and needs met, and the production and posting of one learning module will be complete by May of 2012 (Appendix H Figure 1) in an effort to achieve the primary goals for year one.

Phase 2: Upgrade and Continued Development

Create a "collapsible studio" which will increase the quality of the production by May 2013. Competency in production will allow for an additional four modules to be produced. The impact will be on less labor hours and a higher investment in equipment (Appendix H Figure 2). Continued development and training of staff on upgraded equipment and procedures will play a dominant role in this phase.

Phase 3: Full Production

Additional purchase of equipment will fulfill a "media rich environment" that increases the quality and quantity of production. Exploration of "live" capabilities and feasibility will be a focus in this phase. Competency in production will allow for additional modules to be produced at a faster rate. The impact will be on less labor hours and a higher investment in equipment. The purchase of applicable equipment and staff technical training will ease the burden of virtual learning environment sustainability and improve chances that attainment of full implementation goals will occur by May 2014 (Appendix H Figure 3). This will allow for production and hosting of an additional ten modules to complete the suite of 15 marine science virtual learning for K-12 students.

Communication Plan

The Change Management Team (Appendix I Figure 1) has established strategies for informing key stakeholders of details related to each phase of the project. The purpose of the Communication Plan is to inform, coordinate, update, encourage buy-in, facilitate feedback, organize and identify tasks in an effort to keep all stakeholders involved in the change process. Stakeholders are categorized as Internal and External groups. The Internal group consists of the Program Director, Program Coordinator, Program Associate, Curriculum Designer, Web Content Manager, Virtual Facilitator, Finance and Resource Manager, Instructional Designer, and Instructional Technologists. The External Group consists of Secondary School Science Instructional Consultants, Parents, UNCW Marine Science Faculty Advisor, select Subject Matter Experts, and various UNCW faculty members. Formal face-to-face meetings and written and verbal methods will be main forms of communication in a singular, weekly, or monthly frequency as deemed appropriate (Appendix E Figures 1 and 2). Designated messengers will have added responsibility of informing all other stakeholders of plan progress throughout entire change process.

Design of Infrastructure

MarineQuest is a subsidiary department of the University of North Carolina Wilmington. The infrastructure necessary for their change has been well provided for by the University's IT and Media Departments. The analysis of the current technology and infrastructure (Appendix D) revealed that all necessary infrastructure components are in place to begin this project with no additional consideration.

Professional Development Plan

A needs assessment and gap analysis of the human resources of MarineQuest indicate that the core staff will be responsible to implement the technology change. As the program expands, additional UNCW faculty will become involved as virtual instructors.

Professional Development Needs

Current Human Resources	Proposed Human Resources	Gap
Current staff deliver on-site curriculum	Current staff to produce and deliver virtual learning	Training is required on the technology to support production of the virtual learning environment
		Professional development is required based on assessment of competency to instruct virtual learning modules
UNCW Faculty	UNCW faculty will be featured in the virtual classroom as guests when appropriate to the topic content	Professional development may be required based on assessment of competency to instruct virtual learning modules

A skills inventory assessment identifies gaps in two primary categories to support a virtual learning environment: curriculum and production (Appendix F Figure 2). Additionally, professional development on best practices (Appendix F Figure 3) to support effective learning in the VLE will be necessary for the Project Coordinator and the UNCW faculty who will be acting as instructors in the virtual environment.

Professional Development Goals and Benchmarks

Research and analysis of the staff and professional development models reveal that a blended learning approach to development of the MarineQuest staff is the best course of action (Appendix F Figure 1). Recognizing the depth of staff knowledge with on-site curriculum, an inquiry method will be used to support selection of components of the current on site curriculum that will transfer to a virtual environment. This method will also support skill development for virtual instruction in all phases of implementation.

A different approach will be required to build technical competence with the equipment to support production of the virtual learning. The direct instruction method is the most suitable to meet the goals to develop technical competence. This method is systematic in its design and allows for material to be presented in small steps, pausing to check for student understanding. It also elicits active and successful participation, which will increase the transfer of learning (Rosenshine 1986) during all phases of implementation.

The second phase of implementation will go beyond building competence with equipment to include training on production techniques. Job embedded staff development will allow for staff to become competent at their own pace and apply the information when they are producing the modules. In phase three, the job embedded staff development will be critical as production capacity increases to deliver the full implementation of 15 learning modules.

Once the modules are in full production and additional core of UNCW faculty are involved in the virtual learning environment, a community based learning model to share best practices of instruction will act as a forum to refresh the learning with relevant concepts and contribute to high quality learning.

Professional development is a continuous process. To support continuous improvement, a just-in-time reinforcement model will be deployed in the form of a Wiki to supplement the technical training on the production equipment and provide tips for virtual instruction. The Wiki will be developed in phase one and updated accordingly through phases two and three by the Instructional Designer and IT Specialist.

Feedback on the success of the professional development will be determined by the quality of the production and teacher evaluation of the virtual learning.

Technology Support Services

Technology support system

The organizational structure and small staff of MarineQuest does not lend itself to a full time staff member wholly dedicated to technology support. Currently, a non-discipline specific IT specialist is available for technical support. The Instructional Designer, also an IT specialist, is available on an as-needed basis to provide the staff with the necessary technology support needed to meet the current demand, which after phase 1 implementation and staff development is minimal.

Technical support services for the virtual learning environment will be based on a structured three level support system, which incorporates cost-effective staff training and support resources for common issues and proceeds to external contracted support consultants in instances of dire need.

MarineQuest staff and project teams will attend professional development training with the Instructional Designer and IT specialist to provide basic first level support, such as operation, production, uploading of content, and basic troubleshooting. The current IT Specialist will continue to provide support at this level as well. The second level of support will be the current IT specialist and a Wiki created by the Instructional Designer, which will detail basic operations and methods as well as assess common issues that may occur. Third level Technology Support will take the form of external contracted services and product specific maintenance and replacement agreements. External support for end users will be accomplished through web based tutorials and a site fact page. All other support will be demonstrated through end user's own technical support system.

Benchmarks and measures for technology support

Levels of Support	Responsibilities	Benchmarks	Measure
Level 1 Support MarineQuest Staff IT Specialist	Curricular design for on line delivery. Virtual learning environment production. Module uploading to site Minor troubleshooting.	Instructional Consultants positive feedback will be primary indicator of successful implementation. By March 2012 issues not forwarded to either IT specialist or Instructional Designer is indicative of quality Level 1 support	Evaluative procedures detail improvement procedures
Level 2 Support IT Specialist Instructional Designer	Technical Training Creation of MarineQuest Wiki and Tutorials Major troubleshooting Manage Fact page	Instructional Consultants positive feedback will be primary indicator of successful implementation. By May 2012 Issues involving equipment and web management will proceed to Level 3	A combination of IT Specialist and Instructional Designer responses and IC feedback will provide details for future issue resolution and procedural improvement.
Level 3 Support External Support	IT Contracted Services Equipment Support (Brand specific, ie Adobe for Final Cut Pro, Sony for video camera)	Client satisfaction will be the primary indicator of successful implementation. By August 2012 Level 3 services will adequately and quickly resolve issues involving web management and brand specific products	A combination of IT Specialist and Instructional Designer response, IC feedback, and interaction with Level 3 support services will provide details for procedural improvement.

Project Budget and Timeline

Project budget was developed around the three-phase approach to the implementation plan. The timeline is aggressive, serving the purpose of maximizing seasonal downtime of the 2011-2012 academic year. Cost estimates are broken down into phases, which will allow each one to be budgeted separately. Additional cost analysis is given for the total project when viewed as a full implementation.

Phase 1 Budget: Initial Program Launch

The purpose of this phase is to build a complete, basic system MarineQuest staff can use to develop multimedia programming which meets the goals and objectives set for in Phase 1 of the project. MarineQuest already partially owns the necessary equipment but requires a few small but necessary pieces to begin production. Of additional cost is training and professional development for staff users.

Equipment Type	Cost
Camera Tripod	$458.99
Basic Lighting Kit	$1800.00
Wireless Microphone Kit	$1220.00
Professional Development and Training	$ 750.00

Phase 2 Budget: Production Volume Upgrade

During this phase, the systems involved will be updated from that of a basic system to that of an advanced one. This will allow production volume to increase while labor costs are decreased. It is estimated that the phase one system will allow the production of a video-learning module with approximately eight to sixteen hours of labor. The facility improvements to provision in Phase 2 will cut this time 75%. Key pieces of equipment are necessary to facilitate this upgrade in capacity. Additionally, further training on the new systems and advanced methodologies are necessary.

Equipment Type	Cost
Studio Video Switcher	$9589.50
Studio Recorder	$3212.80
Robotic Control	$1223.40
Robotic Mounting	$640.00
Cabling and Integration Costs	$450.00
Professional Development and Training	$1,100.00

Phase 3 Budget: Addition of Live Production Capabilities

The final phase of the project incorporated the addition of equipment that will allow further increases in production capacity as well as live video streaming systems. The live capabilities will facilitate more interactivity and allow MarineQuest to reach an audience in real time. As with the Phases 1 and 2, additional training will be necessary to educate staff on new capabilities and methodologies.

Equipment Type	**Cost**
Second Robotic Camera	$8540.50
Live broadcast streaming equipment	$3500.00
Professional Development and Training	$600.00

Project Timeline

The project timeline for the educational outreach program is driven by the resource demands of the MarineQuest Summer Camp Program, which typically start in June. Phased deployments are scheduled to be completed by the end of each May, beginning year 2012. This does not include a short evaluation window following each completed phase. This is further detailed in Implementation plan.


Phase 1
Completed May 2012
Phase 2
Completed May 2013
Phase 3
Completed by May 2014

Evaluation

In the spirit of continuous improvement, evaluations by the Evaluation Team (Appendix I, Figure 2) will take place during each of the phases to assess success, feasibility, and sustainability. Assessment will incorporate data analysis and user feedback. After a year of final implementation of 15 virtual learning modules, full evaluation of virtual learning environment will be completed by an external focus group of users.

Phase 1

Phase 1 Outcome	**Impact on Success**	**What does it look like?**	**How will you use data?**
The completed Physical Oceanography module will be beta-tested with focus group representatives from 8th grade science teachers.	The feedback loop will be established to deliver high quality production.	Project Associate has commitment from minimum of 8 representatives to hold focus group session.	Data from focus group will be used to improve the curriculum for Phase 2 production.
Phase 2 Outcome	**Impact on Success**	**What does it look like?**	**How will you use data?**
Interaction with the test group of middle school science teachers creates a success profile that enables MarineQuest to expand production of modules to include elementary and high school students.	An increased number of virtual learning modules that appeal to a broader range of students contribute to a higher competency of science with EOG test scores.	More students across a diverse background express an interest in the field of marine science. More students across a diverse background inquire about the on-site sessions at MarineQuest.	Recommend improvements to delivery of virtual learning modules.
Phase 3 Outcome	**Impact on Success**	**What does it look like?**	**How will you use data?**
Each year targets for increased participation in outreach, science competency scores and increased representation of minority and gender demographics show an improvement of <10%.	Continuous improvement in the number and quality of the virtual learning environment increases interest in MarineQuest programs. Improved science competency scores raise profile of students in North Carolina.	More students from a diverse background inquire about careers in the marine science field.	Staff continues to produce high quality virtual learning refreshing the supporting content as needed.

APPENDIX

Appendix A - Policies, Laws and Standards

Technology policies as they relate to the change process

MarineQuest is a department of UNC Wilmington (UNCW), of the University of North Carolina System, a public university system. As such is it subject to internal UNCW policies, policies of the University of North Carolina System, and North Carolina state laws. Through research we have found that UNCW derives it's policies directly from the UNC System and applicable state laws. UNCW employs an IT Policy Assurance Compliance Officer who ensures that UNCW's internal policies meet the requirements of the system and law. Policies are also vetted by UNCW's legal council and signed with the authority of the Board of Trustees and the Chancellor.

User accounts

The deployed system will be web based in nature and requires further explanation of three different levels of user account permissions. User accounts will be managed on three levels; Administrator, Contributor, Viewer. Administrators will control the template, style sheets, and other structural elements. The administrator will be the systems administrator with the UNCW Media Production Department. Contributors will be MarineQuest staff who are building the online video content and posting it to the website. Administrators and contributor's user accounts and access levels will be controlled with UNCW's Active Directory systems. Both client side systems and servers are bound to the Active Directory LDAP, which will control rights and permission level of access. The third level will be the web visitor. They will be accessing the files through the APACHE web server, which will in turn be accessing the files through a simple POSIX compliant user system with read-only permission. Since read only viewer accounts will be effectively anonymous only administrator and contributor accounts will be subject to policy.

Applicable policies and summary of apposite clauses applying to contributors and administrators:

1. UNCW Policy 07.100.01 - USER ACCOUNTS AND AUTHORIZED ACCESS:
    a. Usernames are granted for use only by the individual whom they were issued
    b. Users are responsible for protecting their accounts
    c. Users may not use the accounts of one another
2. UNCW Policy 07.100.02 - SECURITY
    a. Users must use strong passwords for their accounts.
    b. Users must use the account assigned to them and may not use that of another.

Security

Security is essential to any web enabled system. Since the system is publicly accessible it will potentially be open to attack and vandalism on a global scale. Applicable policies and summary of apposite clauses applying to contributors and administrators:

1. UNCW Policy 07.100.02 - SECURITY
    a. Users must protect their accounts
    b. Users may not use the account of another
    c. Users may not circumvent any security measures
2. UNCW Policy 07.300 - NETWORK SECURITY

a. MarineQuest and staff and server administrator of the systems where the data resides is considered to be "custodians" of that data. They will be accountable for its welfare.
b. All data is subject to the N.C. Personnel Records Act.
c. All data is subject to FERPA regulations.

Rights and Responsibilities of Users

Users of information technology systems and networks at UNC Wilmington have certain rights and responsibilities. Users must use systems responsibly and by policy have little rights to privacy on UNCW systems. At its core, the proposed project requires hosting of video online which puts significantly more load on the network than other application layer services. By effect, users could impact others if systems related to this project are not used responsibly. This section implies responsible action, lack of consideration of responsibilities could be considered to fall under the abuse policies covered in the *Abuse of Computing Resources* section of this appendix.

Applicable policies and summary of apposite clauses applying to contributors and administrators:

1. UNCW Policy 07.100 - RESPONSIBLE USE OF ELECTRONIC RESOURCES
    a. Users will not violate any laws, including copyrights.
    b. Use of technology systems must not interfere with the main mission of the University.
    c. Systems or practices must not endanger the integrity of the University's computer networks.
2. UNCW Policy - 07.100.06 - INTERFERING WITH THE RIGHTS AND ACTIVITIES OF OTHERS
    a. Hoarding or over-consuming electronic resources, such as bandwidth, as to interfere with the regular use by others.
    b. Running inefficient programs that interfere with campus electronic resources.
    c. Create or maintain web pages or applications that by over consumption could drain university resources. If a web page requires significant resources, provision of a private Internet provider may be required.

Abuse of computing resources

Abuse of computer resources is unacceptable in any organization. UNCW has specific policy to address cases where it becomes an issue. This can somewhat be tied into section 2.3, Rights and Responsibilities, but reflect more purposeful disregard for electronic resources. Applicable policies and summary of apposite clauses applying to contributors and administrators:

1. UNCW Policy 07.100.08 - ABUSING, DAMAGING, OR DESTROYING ELECTRONIC RESOURCES
    a. Overload of computer systems or networks.
    b. Disable, damage or obstruct any user or electronic resource.
    c. Waste or hoard electronic resources.
    d. Physically damage any technology system.
    e. Impact the availability of systems.
1. UNCW Policy - 07.100.06 - INTERFERING WITH THE RIGHTS AND ACTIVITIES OF OTHERS
    a. Hoarding or over-consuming electronic resources, such as bandwidth, as to interfere with the regular use by others.
    b. Running inefficient programs that interfere with campus electronic resources.

System Administrator's Responsibilities

The proposed technology change will require videos to be hosted on specialized media servers hosted by the campus' media department. The systems administrator will be bound to meet high availability,

data backup, redundancy, security, and proper system requirements. Applicable policies and summary of apposite clauses applying to contributors and administrators:

1. UNCW Policy 07.200.02 - SERVER STANDARDS AND MANAGEMENT (Policy primarily applies to UNC Wilmington Department of OSA systems. With this being a departmental project hosted on departmental systems only sections 5, 7, and 9 of this policy apply).
    a. Section 5 - Departmental Servers
        i. Departmental servers must have proper support personnel in place to support them.
        ii. All departmental servers must be in compliance with "UNCW Server Protocols".
    b. Section 7 - Streaming Media
        i. Media files are to be streamed from supported media content servers or iTunesU.
    c. Section 9 - Security and Encryption
        i. All stored passwords must be encrypted.
        ii. Encryption standards are maintained by the UNCW Vice Chancellor of ITSD
2. UNCW Server Protocols (not official policy but referenced by official policy)
    a. Hardware must be properly sized.
    b. Hard drive redundancy must be utilized.
    c. Systems must have maintenance contracts.
    d. Systems must be backed up.
    e. Server must utilize latest patches and security updates.
    f. Must run an approved, network operating system.

State/National technology standards relating to the technology plan.

MarineQuest is a branch of UNCW's Division Of Youth Services and will deliver curricular content virtually in accordance with state and national technology standards. Given that the Internet will be the vehicle for delivering the technology change to the public sphere, it is important to note that the main purpose of the MarineQuest site is to provide the public with easy and clear access to information and educational resources they may need. In North Carolina, state technology standards for students are governed by National Education Technology Standards.

State Technology Standards

Teachers of North Carolina impacted by MarineQuest's virtual classroom must adhere to the "North Carolina Technology Standards & Performance Indicators for Educators", specifically the 3rd standard regarding teaching, learning, and curriculum:

Teachers implement curriculum plans, which include methods and strategies that apply technology to maximize student learning.

1. Facilitate technology-enhanced experiences that address content standards and student technology standards.
2. Use technology to support learner-centered strategies that address the diverse needs of learners.
3. Apply technology to develop students' higher order skills and creativity.

National Technology Standards

Instructors and students utilizing the aforementioned virtual curriculum will abide by the standards set forth in the National Educational Technology Standards for Teachers.Standard 2,*Design and Develop Digital-Age Learning Experiences and Assessments* is the most applicable to the technology change, which states:

Teachers design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes through:

a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.
b. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.
c. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.
d. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching

National Educational Technology Standards for TeachersStandard 3,*Research and Information Fluency*, states:

Students apply digital tools to gather, evaluate, and use information through:

a. Plan strategies to guide inquiry.
b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
d. Process data and report results.

National Educational Technology Standards for Teachers Standard 4: *Critical Thinking, Problem Solving, and Decision Making* where:

"Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources by:

a. Identify and define authentic problems and significant questions for investigation.
b. Plan and manage activities to develop a solution or complete a project.
c. Collect and analyze data to identify solutions and/or make informed decisions.
d. Use multiple processes and diverse perspectives to explore alternative solutions"

The program adheres to the North Carolina Standard Course of Study and teachers utilizing the program follow North Carolina's Department of Public Instruction Professional Teaching Standards. North Carolina Teachers are impacted with regards to North Carolina Professional Teaching Standards standard 4, which states:

1. Teachers integrate and utilize technology in their instruction.
2. Teachers know when and how to use technology to maximize student learning. Teachers help students use technology to learn content, think critically, solve problems, discern reliability, use information, communicate, innovate, and collaborate.
3. Know appropriate use.
4. Help students use technology to learn content, think critically, solve problems, discern reliability, use information, communicate, innovate, and collaborate.

ADA Compliance

Distance learning services will be in compliance with The Rehabilitation Act, Section 508, [29 U.S.C. 794(d)] stating:

As amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998 states in part that the individuals with disabilities who are members of the public seeking information from a government agency to have access to and use of information and data that is comparable to the access to and use by individuals without disabilities. However, under General exceptions, Subsection 1194.3(d), agencies are not required to purchase products for access and use by individuals with disabilities at a location other than that where the electronic and information technology is provided to the public.

State and National Curricular Standards relevant to technology change (Exemplified)

MarineQuest's virtual classroom curriculum will adhere to "North Carolina Standard Course of Study for Science". Adopting a phased in approach to production of the videos, our recommendation to support **Physical Oceanography** lesson plans as the initial curriculum relates to the following standards: Specifically 8th grade science Competency Goal 3: The learner will conduct investigations and utilize appropriate technologies and information systems to build an understanding of the hydrosphere.

Objectives:

1. 3.01 Analyze the unique properties of water.
2. 3.02 Explain the structure of the hydrosphere
3. 3.03 Evaluate evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms
4. 3.04 Describe how terrestrial and aquatic food webs are interconnected.
5. 3.05 Analyze hydrospheric data over time to predict the health of a water system

National Curriculum Standards

The MarineQuest virtual curriculum will also conform to "National Science Standards", specifically the National Science Standard 5-8 (A) Understandings about Scientific Inquiry and (B) Motions and Forces.

Appendix B - Change Model Rationale

Since the client has not specified a desired outcome in terms of quality, but instead a range of quality and quantity, we feel the Kotter model best supports this type of change. John P. Kotter, a Harvard Business professor, is the author of two books on change, Leading Change (1995) and Heart of Change (2002). The essence of his change process is built to see, feel and change.

The proposed change will act as a complement to the existing curriculum that is offered to visiting secondary science classes. The linear design of the Kotter model will help outline a progressive set of steps to increase the success of reaching the desired outcome. The organization operates as a division of the Public Service and Continuing Studies of UNCW. The Kotter method fits well into the culture of a classical hierarchical structure. The permanent staff of the youth programs for the Center for Marine Science is comprised of three people, with the addition of up to 60 part-time resources during the hosting of summer camps. The seasonal nature of the outputs of the organization creates an uneven tempo of work. The gaps in work demands introduce a risk that the introduced change can lose its momentum in the intensity period. The Kotter method provides for a systematic approach to build on the change and anchor it to the culture. The sense of urgency that sparks motivation in Kotter's model is demonstrated in the enthusiasm of the director to initiate this change. The progressive, linear nature of the model will help provide structure for the expectations of the outcomes and allow us to present tiers of investments. Along the same lines, the focus on short term wins of the model will help build sustainability of the change by creating a phased approach to building the digital curriculum. Referencing the model and action items in the table below, the current environment to support the change has limited visibility with the client as noted by the steps in the model represented by italics. Following the successive steps will raise the probability to deliver a digital curriculum that has sustainability rather than a single product in a box.

Appendix B, Figure 1 – Change Model

Kotter Change Model	Summary of Actions
Increase Urgency	Inspire people to move, make objectives real and relevant.
Build the Guiding Team	Get the right people in place with the right emotional commitment and the right mix of skills and levels
Get the Vision Right	Establish a simple vision and strategy, focus on creative aspects to drive service and efficiency
Communicate for Buy-In	Involve as many people as possible, communicate the essentials simply and to appeal and to respond to people's needs
Empower Action	Remove obstacles, enable constructive feedback
Create Short Term Wins	Set aims that are easy to achieve. Finish current stages before starting new ones.
Build on Change	Don't declare victory too early. Seek improvements. Early success provides an opportunity to build on what went right and identify improvements.
Anchor in Culture	Communicate success stories

Appendix C - Current and Desired Resources

Physical Resources Already Available:

- Professional quality robotic camera capable of interfacing with automated systems
- Professional quality camcorder
- Two Apple MacBook Pro laptops with Final Cut Studio video editing software installed
- "Smart Cart" rolling flat screen TV.

Phase 1

This is the lowest tier and represents the minimum equipment necessary for meeting the client's minimal expected need. In addition to the equipment in inventory the client will require several key resources:

- A camera platform (tripod) to hold the camera level and straight
- Basic lighting equipment for videography
- Technical training on camera techniques and editing software
- A microphone kit (wireless recommended)

With tier 1 a relatively good level of quality can be achieved but will require a labor-intensive process relative to the quality level desired. Deploying at this level will allow the client to enter the market with a minimum capital outlay but will require that they redirect labor resources to this project. Tier 1 will require approximately $2-4000 for hard products and an estimated 16-20 staff-hours per production.

Phase 2

This tier represents the addition of more structured and technical systems that will allow for a faster workflow, will require less labor, as well as better quality and a more consistent product. This will be accomplished by adding studio grade elements to the MarineQuest lab. In addition to the equipment in Tier 1 the client will require additional resources including:

- A studio grade VTR
- A studio video switcher
- Robotic control and mounting
- Terminal equipment and cabling
- Technical training on production techniques
- Monitor

Tier 2 will form a basic production environment and set up a small "collapsible" studio. The core concept is to permanently mount the robotic camera in a central location of the lab where it can provide "wide" shots of the facility with the smaller camcorder being used for close-ups and cut-away shots. One of the MacBook Pro laptops can be used to insert graphics such as PowerPoint presentations. The switcher would then "mix" the video together by selecting the different cameras for the "live" shot. The mix would be recorded to a hard drive system that would provide a nearly complete product. This tier would advance the quality and further reduce the labor necessary by approximately 50% over tier 1 while costing roughly $10,000 more than Tier 1.

Appendix C - Current and Desired Resources - Continued

Phase 3

This tier advances the concept behind Tier 2. This involves building the lab into a media rich facility with studio elements providing for further increase in quality of production and additional reduction of associated labor. It is also recommended that "live" capabilities be explored at this point. Recommendations for equipment in Tier 3 include:

- Additional Robotic Camera and peripheral equipment
- Simulcast web deliver allowing for "live webcasts".

Tier 3 will allow for more advanced camera shots by adding an additional robotic camera, an identified cost concession in the first two tiers. This will reduce the need for a second camera operator there by reducing labor costs another 10-20%.

Appendix D– Site Survey:Assessment of Resources and Infrastructure

Current Technology and Related Facility Resources

Several meetings and site surveys of the MarineQuest facility and operations have revealed earlier attempts at this project. Several key pieces of equipment have already been purchased, though no successful deployment or project implementation has occurred.

Facilities

The MarineQuest facility consists of a laboratory located inside the UNC Wilmington Center for Marine Science. The complex is located approximately seven miles from UNC Wilmington's main campus. The geographic distance from main campus has resulted in technological challenges met by outsourcing of network infrastructure from Time Warner, a regional multi-system operator. Technical services to be provisioned with this project suggest a client-server model. The MarineQuest laboratory will stand as a client-side facility serving the role of content production. This facility has solid physical attributes typical of most laboratories. As such, electrical and network infrastructure are hardened to standards beyond what is typically necessary for client side work. The only obvious facility concerns regard light and are covered in section six, Gap Analysis.

Hardware

The concept of a video classroom has been in the conceptual phase for some for several years. Internally, departmental staff and leadership have made minor, incremental efforts to deploy systems necessary to create online video modules. Because of these efforts, Marine Quest has the necessary hardware to begin a basic version of the program they wish to develop. The core technologies are in place. A survey of the site reveals the following equipment, which could be leveraged to meet the needs of the proposed project.

Appendix D, Figure 1

Equipment	Purpose	Qty	Age (yrs)
Macbook Pro	Video Editor	2	.2
Dell Laptop	Student Laptops	14	3
Dell Netbook	Student Laptops	10	.2
LCD Monitor	Smart Cart	1	3
Mac Mini	Smart Cart	1	3
Camcorder	Field video recording	1	.2
Robotic Camera	Classroom video	1	3
DSLR Camera	Still Photography	1	3
Tower Computers	Workstation	3	1.5 - 4
USB Microscopes	Digital Microscope	6	3
Underwater Case	Use camera underwater	1	.2

Software and Soft Systems

MarineQuest has the necessary editing software to post produce the videos they wish to show online. The product is a suite of applications intended for the project they are pursuing. They also have access to the campus media management system to aid in media management and cloud based operations.

Appendix D, Figure 2

Software Title	Purpose	Licenses	Version
Final Cut Studio	Media Editing	2	3.#
Final Cut Server	Media Management	Unlimited	Cloud
Analytics	Web Traffic Metrics	Free/Open	Cloud

Network

The network infrastructure necessary for their change has been well provided for by their parent organization's IT and Media Departments. In physical terms, the network consists of an internal LAN

inside of CMS connected to the main campus through a bridge carried over Time Warner's fiber optic metro ring where CMS draws its application level services. The physical and data link layers consist of copper based Category 6 cabling with a single mode fiber optic gateway link carried through Time Warner's metro ring. The network layer shows client connections as 100Mb/s. The MarineQuest lab has also installed an enterprise grade wireless access point with G rated speeds inside of their lab. The gateway connection is a 40Mb/s bridge through Time Warner's fiber optic infrastructure back to UNCW's main campus. No QoS exists nor is the network multicast enabled. Most application layer services are drawn from UNCW back to CMS and subsequently Marine Quest through this bridge. User directories are drawn from the UNCW Active Directory LDAP. DNS is also drawn from the campus nameserver. Hosting services for their video delivery site will be provided with a rate of 20Mb/s.

Human resources

The human resources for this department are very flexible. The unit consists only of four full time staff members but employs a large seasonal staff as the need arises. The full time staff will be the executors of the technology change; seasonal staff roles will not be impacted.

Appendix D, Figure 3

Position Title	Name	Duties
Director of Youth Programs	Sue Kezios	Director of operations
Training Specialist	Jeremy Burnett	Conduct the various youth programs
Program Associate	Heather Brand	Conduct the various youth programs
Administrative Associate	Danice Grkinich	Handles administrative tasks
Seasonal Staff	Seasonal Staff	Labor for youth programs
Randy Turner	IT Consultant	Technician - non-discipline specific systems

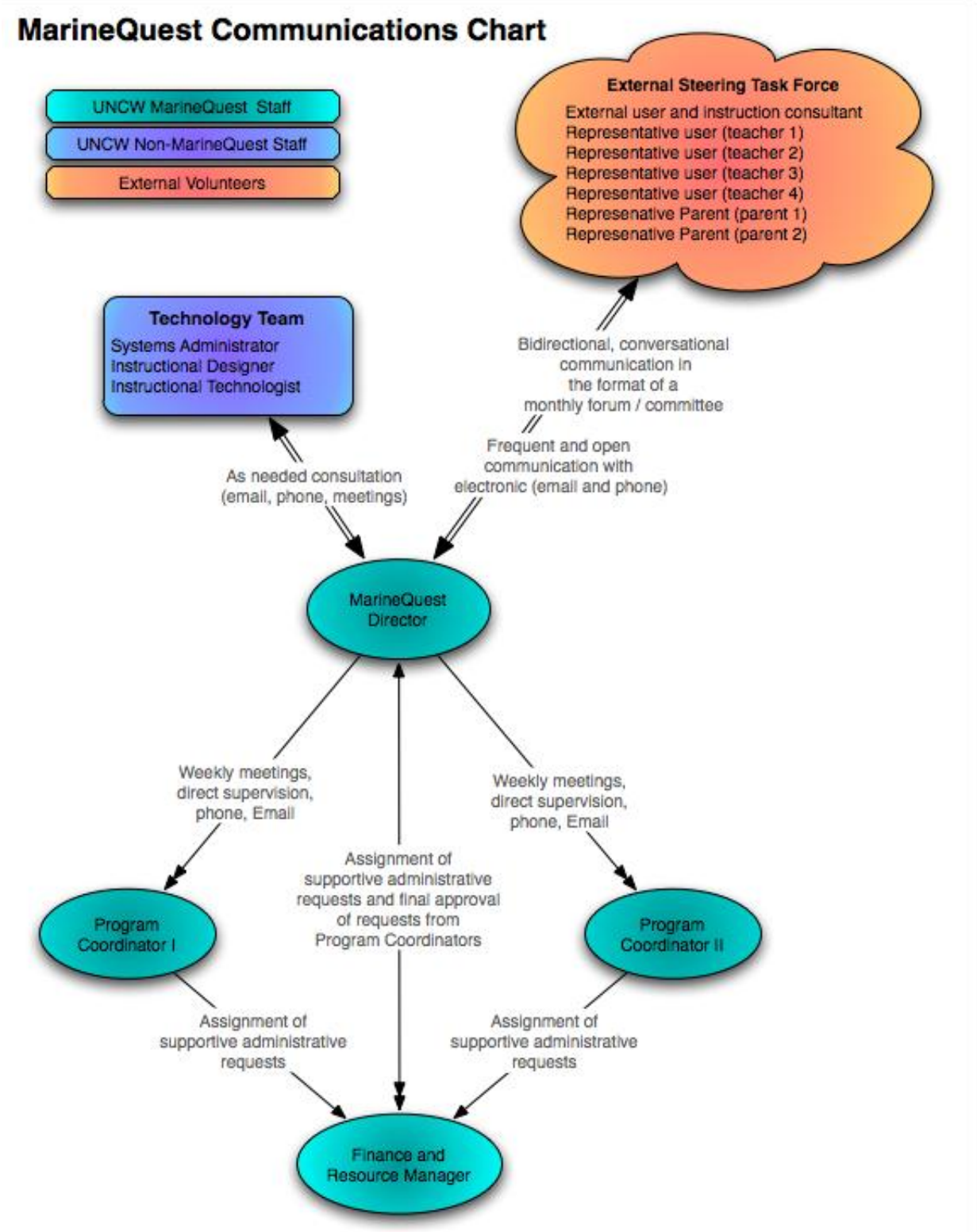
AppendixE – Communication Plan

Figure 1

Stage and Objective of Communication	Stakeholder Group	Format	Vehicle	Frequency	Messenger
Vision To develop vision	Instructional Designer, Curriculum Designer, Program Director and Coordinator	In person	Meeting	Single meeting	Program Director Instructional Designer
To communicate vision	Internal and external groups	Written	Email Social networking Website	Single communication	Program Coordinator
Goal Setting To develop goals of project	Program Director, Program Coordinator, Instructional Designer	In person	Focus Group	Single session	Instructional Designer Curriculum Designer
To communicate goals of project	Internal and external	Written Verbal	Email Phone	Single communication	Program Coordinator
Data Gathering To assemble the multiple perspectives, evaluate the current state and identify future state gaps	Program Director and Coordinator, Program Associate, Finance and Resource Manager	Verbal Written, On-Line	Meetings Phone Email Collaboration site	Initial meeting Follow up as needed to validate findings	Instructional Technologists Program Director
	UNCW Marine Science Faculty Advisor, Secondary Science Instructional Consultants	On-line Verbal	Conference call Focus Group	Initial session with monthly follow up as needed to validate findings	Program Coordinator
Implementation Phase 1 Communicate work flow process to support production of content	Internal group	Written Verbal	E-mail, Web Site Phone	Individually as needed	Instructional Designer Curriculum Designer Program Director
Communicate availability of virtual classroom for 8th grade audience	External group		Email Link to U-Tube Phone Meeting	Monthly committee forums	Program Coordinator
Implementation Phase 2 Update on implications of	Program Director, Coordinator, and Associate, Instructional and	Written, Verbal, and On-Line	E-mail, Meetings, Phone, Web Site	Weekly	Instructional Designer

roles based on increased production capability	Curriculum Designer		Content		Program Director
Communicate additional virtual learning classroom for high school	External	On-Line Written	Email link to U-Tube Public Relations placement in local media	Single communication	Program Coordinator
Implementation Phase 3 Update on implications of roles based on increased production capability	Internal	Written, Verbal, and On-Line	E-mail, Meetings, Phone, Web Site Content	Weekly	Instructional Designer Program Director
Communicate additional virtual learning classroom for elementary school	External	On-Line Written	Email link to U-tube Public Relations placement in national media	Single communication	Program Coordinator
Evaluation Communicate results and seek input for improvement	Program Director, Program Coordinator, Curriculum Designer, Web Content Manager, Secondary Instructional Consultants, Parents	Written, Verbal, and On-Line	E-mail, Meetings, Phone, Pre and Post Surveys Web Site Content	Update as needed	Program Director and Web Content Manager

Appendix E, Figure 2 – Communication Plan Chart



Appendix F–Professional Development Plan

Figure 1

Professional Development Opportunity	**Target Audience** ***Who is impacted?***	**Goals** ***What do they need to learn to support change?***	**Strategies** ***How will they learn?***	**Measures** ***How will they demonstrate competency?***	**Benchmarks** ***What will describe its success?***	**Completion Date**
Effective use of virtual curriculum to broaden reach of MarineQuest outreach program	Program Director Program Coordinator Program Associate	Identify the components of the on-site curriculum to adapt to virtual curriculum	Kick-off meeting to establish pilot course to adapt to virtual curriculum Utilize inquiry method to identify components that will be adapted to virtual curriculum	Output of meeting	Project Plan	Project inception
	IT Specialist	Understand the components that will be basis of virtual curriculum	Join staff in inquiry session	Output of meeting	Timeline for production established	Project inception
	UNCW Faculty	Understand their role in virtual curriculum	Meeting with program director And IT Specialist	Observation	Quality of production of pilot virtual curriculum	Phase 1
Adapting current on-site curriculum to virtual curriculum	Program Director Program Coordinator Program Associate	Formulate the process of adapting the curriculum	Staff will work together to translate the on-site curriculum to virtual curriculum Develop outline of lesson plan Identify components to adapt to virtual curriculum Identify components that will be part of support material	Output of meeting	Completed template for production of pilot and future virtual curriculum	Phase 1
Production of video portion of virtual curriculum	Program Director Program Coordinator Program	Demonstrated competency with video recording equipment	Two half-day classroom supported with direct instruction Wiki reinforcement	Observation Assessment	Staff pass assessment of technical knowledge Use of technical	Phase 1

	Associate UNCW Faculty				support	
Staff will use Final Cut Pro for editing	Program coordinator Program Associate IT Specialist	Demonstrated competency with software program	Two half-day classroom supported with direct instruction Wiki reinforcement	Observation Use of Wiki	Completed production Use of technical support	Phase 1
Posting of Curriculum Support	Project Coordinator Project Associate	Demonstrated ability to post on web-site	Half-day classroom supported by direct instruction	Observation	Materials (lesson plan applications, FAQ to scientists) posted on website	Phase 1
Use of studio grade VTR	Program coordinator Program Associate IT Specialist	Demonstrated competency with studio grade VTR	Two half-day classroom supported with direct instruction Wiki reinforcement	Observation Use of Wiki	Staff passes assessment of technical knowledge Use of technical support	Phase 2
Use of studio video switcher	Program coordinator Program Associate IT Specialist	Demonstrated competency with studio video switcher	Two half-day classroom supported with direct instruction Wiki reinforcement	Observation Use of Wiki	Staff passes assessment of technical knowledge Use of technical support	Phase 2
Technical training on production techniques	Program coordinator Program Associate IT Specialist	Demonstrated competency with production techniques	Three half-day classroom supported with direct instruction Wiki reinforcement	Observation Use of Wiki	Staff passes assessment of technical knowledge Use of technical support	Phase 2
Advanced technical training and introduction of video streaming	Program coordinator Program Associate IT Specialist	Demonstrated competency with production techniques	Two days of classroom supported with direct instruction Job embedded staff development	Observation	Staff passes assessment of technical knowledge	Phase 3

Appendix F, Figure 2 – Skills Inventory

Technology Change	Affected Staff	Current Skills	New Skills Needed
Create virtual curriculum to broaden outreach	Program Director Program Coordinator Program Associate IT Specialist	Direct instruction of classroom curriculum design	Virtual design and delivery
Adapting current on-site lesson plans to virtual curriculum	Program Director Program Coordinator Program Associate	Competency demonstrated in curriculum design for classroom based learning	Virtual curriculum to include blended learning with video instruction and posted application support
Production of video portion of curriculum	Program Director Program Coordinator Program Associate UNCW Faculty	Minimal competency with video recording equipment Limited experience with virtual instruction	Full competency in technical delivery including studio set up and video recording Full competency in virtual instruction
Staff will utilize Final Cut Pro	Program Coordinator IT Specialist	Moderate competency with video recording equipment	Training in software
	Program Coordinator Program Associate	No experience	Training in software
Staff will demonstrate competency with studio video switcher, Studio recorder and robotic camera	Program Coordinator Program Associate	No experience	Training on equipment
Staff will demonstrate competency with live broadcast streaming equipment	Program Coordinator Program Associate	No experience	Training on equipment
Posting of Curriculum Support	Program Coordinator Program Associate	No experience	Ability to post support documents
Hosting finished module	IT Specialist	Competent	None required

Appendix F, Figure 3 – Best Practices

Best practices to Support Effective Learning in a Virtual Learning Environment (VLE)

Engage students in the content
Maintain student interest with visuals
Communicate clearly
Provide clear expectations for the learning
Demonstrate appropriate pacing
Guide students through activities (lab) with carefully crafted directions
Voice characteristics: positive, personal, professional, mindful of tone

Ash, Katie. (2009, June 16). Characteristics of 'Highly-Qualified' On-line Teachers.

Appendix G –Registration Data

Fall 2007					
School Name	**Private or Public**	**Grade Level**	**Program Attended**	**Number of Students**	**Location of School**
Fuquay-Varina High School	Public	9th	Coastal Encounters	38	Fuquay-Varina, NC
Gear-Up	Public Prgm	6th	Coastal Encounters	36	Wilmington, NC
Spring 2008					
School Name	**Private or Public**	**Grade Level**	**Program Attended**	**Number of Students**	**Location of School**
Brunswick Community College	Public	9th - 10th	Coastal Encounters	12	NE Supply, NC
Cape Fear for Inquiry	Public	7th	Coastal Encounters	32	Wilmington, NC
Faith Christian School	Private	10th - 12th	Coastal Encounters	37	Rocky Mount, NC
Green Hope High School	Public	9th	Coastal Encounters	28	Cary, NC
Howard Health and Life Science	Public Prgm	9th - 12th	Coastal Encounters	45	Fayetteville, NC
AL Brown High School	Public	9th - 12th	Coastal Encounters	75	Kannapolis, NC
Myrtle Grove Christian	Private	7th	Coastal Encounters	43	Wilmington, NC
New Garden Friends	Private	9th - 12th	Coastal Encounters	24	Greensboro, NC
Resurrection Christian School	Private	6th	Coastal Encounters	23	Charlotte, NC
River Mill Middle School	Public	6th	Coastal Encounters	40	Graham, NC
Wesleyan Christian Academy	Private	9th	Coastal Encounters	32	High Point, NC
Wakefield High School	Public	9th - 12th	Coastal Encounters	55	Raleigh, NC
Bolivia Elementary	Public	4th	Coast to Classroom	110	Bolivia, NC
Coddington Elementary	Public	K	Coast to Classroom	69	Wilmington, NC
St. Mary's Catholic	Private	3rd	Marine Explorers	20	Wilmington, NC
Gear-up Hyde County	Public Prgm	6th -8th	Coast to Classroom	64	Swan Quarter, NC
Southport Elementary	Public	K - 5th	Coast to Classroom	669	Southport, NC
Winter Park Elementary	Public	1st & 5th	Coast to Classroom	85	Wilmington, NC
Christian Home Educators	Private	K - 12th	Marine Explorers	63	Wilmington, NC
Gregory School of Science & Tech	Public Prgm	2nd	Marine Explorers	100	Wilmington, NC
Ogden Elementary	Public	1st	Marine Explorers	119	Wilmington, NC
Fall 2008					
School Name	Private or Public	Grade Level	Program Attended	Number of Students	Location of School
Boys & Girls Club-Lumbee Tribe	Private	6th - 8th	Coastal Encounters	21	Pembroke, NC
Wakefield High School	Public	9th - 12th	Coastal Encounters	53	Raleigh, NC
Boys & Girls Club - Lumbee Tribe	Private	K - 12th	Coast to Classroom	60	Pembroke, NC

Christian Home Educators	Private	K - 12th	Marine Explorers	64	Wilmington, NC
Spring 2009					
School Name	**Private or Public**	**Grade Level**	**Program Attended**	**Number of Students**	**Location of School**
Bishop McGuinness High School	Public	9th - 12th	Coastal Encounters	12	Clemmons, NC
Area L AHEC	Public Prgm	9th	Coastal Encounters	15	Rocky Mount, NC
Green Hope High School	Public	9th	Coastal Encounters	28	Cary, NC
Greensboro Day School	Private	9th - 12th	Coastal Encounters	24	Greensboro, NC
Metrolina Regional	Private	6th	Coastal Encounters	19	Charlotte, NC
Myrtle Grove Christian	Private	7th	Coastal Encounters	53	Wilmington, NC
The Oakwood School	Private	6th	Coastal Encounters	40	Greenville, NC
River Mill Middle School	Public	6th	Coastal Encounters	42	Graham, NC
Wesleyan Christian Academy	Private	9th	Coastal Encounters	45	High Point, NC
Burgaw Elementary	Public	5th	Coast to Classroom	100	Burgaw, NC
Mars Hill Elementary	Public	3rd & 5th	Coast to Classroom	120	Mars Hill, NC
Cape Fear Academy	Private	K	Marine Explorers	44	Wilmington, NC
St. Mary's Catholic	Private	3rd	Marine Explorers	23	Wilmington, NC
Topsail Middle School	Public	6th	Marine Explorers	23	Topsail, NC
Fall 2009					
School Name	**Private or Public**	**Grade Level**	**Program Attended**	**Number of Students**	**Location of School**
The Oakwood School	Private	6th	Coastal Encounters	20	Greenville, NC
Howard Health and Life Science	Public Prgm	9th - 12th	Coastal Encounters	30	Fayetteville, NC
Girls Inc	Public Prgm	K - 8th	Marine Explorers	30	Wilmington, NC
Ogden Elementary	Public	1st	Marine Explorers	106	Wilmington, NC
Amce Delco	Public	2nd	Marine Explorers	42	Riegelwood, NC
Spring 2010					
School Name	**Private or Public**	**Grade Level**	**Program Attended**	**Number of Students**	**Location of School**
AL Brown High School	Public	9th - 12th	Coastal Encounters	75	Kannapolis, NC
Burlington Day School	Private	6th	Coastal Encounters	47	Oak Ridge, NC
Gaston Day School	Private	6th	Coastal Encounters	37	Gastonia, NC
Green Hope High School	Public	9th	Coastal Encounters	30	Cary, NC
Metrolina Regional	Private	6th	Coastal Encounters	20	Charlotte, NC
Myrtle Grove Christian	Private	7th	Coastal Encounters	53	Wilmington, NC
Rachel Freeman	Public	5th	Coastal Encounters	47	Wilmington, NC
Welborn Academy	Private	6th	Coastal Encounters	76	High Point, NC
Wesleyan Christian Academy	Private	9th	Coastal Encounters	49	High Point, NC

Burgaw Elementary	Public	5th	Coast to Classroom	75	Burgaw, NC
Lake Forest Academy	Private	K - 6th	Coast to Classroom	45	Wilmington, NC
Cape Fear Academy	Private	K	Marine Explorers	30	Wilmington, NC
St. Mary's Catholic	Private	3rd	Marine Explorers	24	Wilmington, NC
Topsail Middle School	Public	6th	Marine Explorers	23	Topsail, NC
Classical Conversations of Wilm	Private	1st - 8th	Marine Explorers	52	Wilmington, NC
St. Marks	Private	1st	Marine Explorers	30	Wilmington, NC
Fall 2010					
School Name	Private or Public	Grade Level	Program Attended	Number of Students	Location of School
Gaston Day School	Private	6th	Coastal Encounters	39	Gastonia, NC
The Oakwood School	Private	6th	Coastal Encounters	28	Greenville, NC
JP Knapp Early College	Public	11th	Coastal Encounters	10	Currituck, NC
Ogden Elementary	Public	1st	Marine Explorers	103	Wilmington, NC

Appendix H – Implementation Plan

Figure 1

Phase 1: Design and Development (September 2011 – September 2012) Focus on Technology, Staff and Curriculum			
***Goals* and Benchmarks**	***Strategies*/Activities to Achieve Goals and Benchmarks**	**Indicators**	**Measures**
Increase participation in MarineQuest outreach program **Technology** By 11/2011 a production flow process will be defined to include: ▪ Criteria for selection of current on-site curriculum that can be adapted to virtual learning environment. ▪ A production manual with defined roles and responsibilities to support the administration of production of virtual learning modules will be in place. ▪ The network infrastructure will be in place to support hosting of Physical Oceanography module **Staff** By 3/2012 staff will demonstrate competency with basic camera techniques Staff will demonstrate competency with basic production equipment to include: ▪ Final Cut Pro software	*Essential staff members will meet to create the foundation for the virtual learning* Kick-off meeting with staff to set project timetable to support creation of production flow process. Program Director and Project Coordinator meet to set criteria for selection of on-site curriculum that will transfer with high quality to virtual environment and to outline roles and responsibilities to support administration of production process. Project Associate will set up meeting with IT specialist to determine requirements to host virtual learning Network infrastructure will be assessed to support virtual learning Training will be scheduled for basic camera techniques Initial recording of Physical Oceanography virtual module	Meeting is scheduled on staff calendars, room is secured to hold session Meeting is scheduled on calendars, room is secured to hold session Meeting is scheduled on calendars Assessment completed Equipment available, room for training and instructor available Raw footage of virtual learning	Project timetable is created Production manual is published Checklist established Test of systems Completed evaluation of training session Tape of recorded session

	Staff will be trained on Final Cut Pro software	Software purchased and available, room for training and instructor available Staff will be competent with editing software	Completed evaluation of training session Limited use of technical support
Increase science competency scores with end of year testing **Curriculum** By 11/2011 the design of the virtual module will be defined to include: ▪ Standards to support quality of content that meets NC Standard Science will be incorporated into the curriculum design of the virtual learning By 5/2012 the initial virtual learning module of Physical Oceanography is launched	*Core components will be identified that will be essential to deliver high quality learning.* Standards will be incorporated into production flow process. The initial virtual learning module of Physical Oceanography is launched incorporating feedback from the focus group session.	Key criteria to support quality of course content will be in the production manual Finished production	Production manual Hosted on website
Decrease gender and minority gap in marine science field **Curriculum** By 3/2012 the curriculum design of the virtual module will include : ▪ Support activities that will appeal to targeted groups	*Unique activities will be identified that will engage learners in the target group*. Program Director, Project Coordinator and Project Associate will select support activities to post with virtual learning	Research will be completed to identify components of activities that will interest targeted groups	Support materials of activities will be complete

Appendix H – Implementation Plan

Figure 2

Phase 2: Upgrade and Continual Development (September 2012 through September 2013) Focus on Technology, Staff and Students			
***Goals* and Benchmarks**	***Strategies*/Activities to Achieve Goals and Benchmarks**	**Indicators**	**Measures**
Increase participation in MarineQuest outreach program **Technology** By 10/2012 a"collapsible studio" is created to increase the quality and volume of production of virtual learning **Staff** By 11/2012 staff will demonstrate competence with studio grade equipment including: ▪ Studio grade VTR ▪ Studio video switcher By 2/2013 four virtual learning modules are launched for a total of five virtual learning modules By 2/2013 virtual learning on website is accessed and utilized by teachers and students By 5/2013 a 20% increase in participation in MarineQuest outreach is achieved	*Elements to support studio grade production are in place* A robotic camera will be permanently mounted in a central location in the lab where it can provide "wide" shots of the facility. Staff will be assessed to determine suitable resources for training of production equipment. Technical training on studio grade production will be completed. Production process will be followed to produce four virtual learning modules. Four additional virtual learning modules will be hosted on the MarineQuest website. Site will be assessed to determine its ability to handle the capacity of additional four modules. Staff will promote virtual learning curriculum with public relations campaign.	All equipment to support studio grade purchased and installed Assessment completed by designated staff Completed training evaluation Production project plan completed Production project plan completed for each module Meeting with IT specialist Hosting complete Press release School newsletters	Ability to begin production Production team Identified Ability to begin Production Observation Observation Confirmation by IT specialist Registrations on site Google analytics
Increase science competency scores with end of year testing	*Continual engagement of science community*		

Students By 12/2012 test group of schools will be identified to participate with the virtual learning By 5/2013 10% increase in end of grade science scores at test group schools	Project Associate will work with members of focus group to secure a test group of schools to incorporate the five virtual learning modules into their science curriculum for the academic year. Participating schools agree to share test scores of classes that utilize virtual learning	Letters of commitment from participating schools End of grade test scores sent to MarineQuest staff	Number of positive responses compared to number of requests sent Data is validated from previous year results
Decrease gender and minority gap in marine science field **Students** By 9/2013 a 10% increase in inquiries into the programs at MarineQuest by target group	*Create mechanism to identify close in gap* Project Associate will set up a tracking system to identify demographics Survey will be designed to accompany virtual learning	Tracking system is designed Completed surveys returned	System is functioning on website Survey data

Appendix H – Implementation Plan

Figure 3

Phase 3: Full Production (September 2013 through September 2014) Focus on Students and Technology			
***Goals* and Benchmarks**	***Strategies*/Activities to Achieve Goals and Benchmarks**	**Indicators**	**Measures**
Increase participation in MarineQuest outreach program	*Full production expands outreach to include primary and secondary schools*		

By 10/2013 create "media-rich" production studio to include: ▪ Additional robotic camera and peripherals	Staff adapts production to include new capabilities.	Production quality Improved	Finished product
By 01/2014 Explore "live" capabilities with streaming video technology	Identify opportunities to enhance the learning with streaming video.	New resources are selected	Enhanced curriculum
By 2/2014 increase production of 10 additional virtual learning modules expanding into primary and secondary schools	Staff selects additional learning modules for production that leverage the enhanced production capability.	Production timetable is complete	5 modules are launched on website
By 5/2014 the number of students participating in the MarineQuest Outreach program will increase yearly by 15%	Staff modifies curriculum to adapt to primary and secondary audiences with specific attention to the support activities posted on the site.	Completed virtual learning hosted on website	Google analytics on registration data
	5 additional virtual learning modules are produced and hosted.	Completed virtual learning hosted on website	Google analytics on registration data
Increase science competency scores with end of year testing By 5/2014 yearly improvement of 20% increase in science competency scores reported by science teachers utilizing the virtual learning environment	*Continual engagement of science community* Staff will promote the launch of each of the virtual learning modules Staff will survey those teachers who have accessed the site	News releases Email Number of registered users of virtual learning	Number of science teachers utilizing the site End of grade science scores
Decrease gender and minority gap in marine science field By 9/2014 Yearly increase of 10%	*Monitoring of demographics* Staff will monitor the demographics of participation	Number of	Survey data

of participation of target group in MarineQuest outreach programs	in virtual learning environment	registrations completing voluntary survey	

Appendix I – Implementation Teams

Appendix I, Figure 3 - Implementation Team

Position	Staff Member
Curriculum Designer	Jeremy Burnett
Virtual Facilitator	Jeremy Burnett/Undetermined
Instructional Technology Consultant	Dana Bobbert
Instructional Technology Consultant	Sharon Collins

Appendix I, Figure 1 - Change Management Team	
Position	**Staff Member**
Program Director	Sue Kezios
Program Coordinator	Jeremy Burnett
Instructional Designer	Dana Bobbert
Instructional Technologist	Sharon Collins
Grades 6-12 Instruction Consultant	Sandy Cecelski

Appendix I, Figure 2–Internal& External Evaluation Teams	
Internal Evaluation Team	
Position	**Staff Member**
Program Director	Sue Kezios
Program Coordinator	Jeremy Burnett
Web Content Manager	Randy Turner
External Evaluation Team	
Position	**Staff Member**
Instructional Consultant 1	Sandy Cecelski
Instructional Consultant 2	Bryan Bishop
Eighth grade science teachers	Undetermined
Middle School Science Teachers	Undetermined
Instructional Technology Consultant	Michael Robinson
Web Content Manager	Randy Turner
Technical Director	Undetermined
Operations Manager	Sue Kezios
Finance and Resource Manager	Danice Grkinich
UNCW Marine Science Faculty Advisor	Daniel Baden
6-12 Science Instructional Consultant 1	Sandy Cecelski
6-12 Science Instructional Consultant 2	Bryan Bishop
K-12 Science Instructional Consultant 3	Undetermined
Subject Matter Expert	Varied and Undetermined
Grant Writer	Sue Kezios
Middle School Science Teachers	Undetermined

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