WxLR Training:

a Design & Development Plan

using the A.D.D.I.E. model

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Spring 2015

**Analysis**

***1. Needs Assessment Overview***

The year is 2170 and Artificial Intelligence (AI) has become main stream in every aspect of life on Earth. America’s military is no exception as the U.S. Navy includes 250 AI units serving in its fleet. Since the early 2110’s, The U.S. Navy has utilized robots to assess weather conditions during deployments whether at sea or on dry land in support of air and ground troops. In use are robots called WxLR, an acronym for Weather (Wx) Life-Like Robot, pronounced “wicksler.” There is still an all-volunteer military and an even greater sense of pride among all Americans as technological advances are endless thanks to a robust economy and government support. While AI in the form of these supremely advanced robotics often excel in comparison to their human counterparts as peace keepers, combat forces, and in humanitarian efforts, occasionally differences have become apparent. One case in point is in the field of meteorological observations when downloadable information is not available.

***1.a. Needs Analysis***

While these robots are basically computers on legs, they are more life-like than mechanical with the ability to actually see as humans see and therefore have the ability to interpret images. These AI units function alongside military personnel and are counted as equals when it comes to manpower statistics. The main advantage to using these robots is that they can instantaneously download weather data directly from information beamed to satellites without the delays associated with human interaction.

Military operations must be prepared for all scenarios, backup plans and adaptability of operations is essential with some components of weather observations that must be learned specifically for deployment purposes. Cyberattacks have been minimized due to advances in communication technologies and security, but Naval commands have now decided to revert back to some of the basic fundamentals of observations in order to be able to provide weather updates in the event that high level communications are interrupted or technological compromises occur. After one such event in which major air support became unavailable when a satellite’s signal was hijacked and subsequently rendering all communication relays compromised, force commanders demanded that an alternative training options be established.

A series of debriefings between base commanders and Weather World representatives was scheduled to take place over a two day period. Weather World, Inc. has provided over forty years of support to the military in terms of supplying up to date training modules and state-of-the-art equipment.

***1.b. Results***

Following nearly twenty hours of intense debriefings as to the situation described above as well as other instances, Weather World, Inc. experts were tasked with designing instruction to address the errors being made in the field such as inaccurate estimates of cloud ceilings that prevented proper identification of a targeted landing strip. A design team known as DesigNerds was assigned to the project. Accurate reports of weather conditions would have allowed for adjustments in airplane approaches and landing procedures and because military operations operate on real time with no exception, continued weather updates are critical. Commanders in the field need to have WxLRs now trained to take visual weather clues instead of relying solely on electronic data.

***1. c. Rationale***

After a month-long debriefing of the situation described earlier, the Navy has now commissioned the designing of a tutorial to train WxLRs in the interpretation of current weather conditions (observations) instead of translating coded data provided by electronic sources. Referencing historical practices dating as far back as the 1970’s, instruction needs to incorporate the concepts of basic cloud types and formation along with associated weather patterns. Before AIs joined the military’s meteorology field, the rate of Aerographer’s Mate (AG) served as the Navy’s main weather observers and forecasters and all observations were done in real time. Archived training materials used prior to the inclusion of AIs will be used to support all necessary instruction. A multi-media approach was chosen as the resulting tutorial could also be used to instruct sailors recently assigned to the AG rate to establish consistent competencies.

***2. Audience Analysis***

***2.a. Entry Behaviors***

Those being subjected to the training will be assessed in the areas of math skills and science concepts related to weather through a battery of tests administered by the U.S. Navy. All students must achieve scores of “proficient” or better to be considered for this instruction. Remedial courses are available for those who fail to meet these standards.

***2.b. Prior Knowledge of the Topic Area***

The WxLR units already have easy access to satellite provided information, so they do not store data internally. Prior knowledge required of the human counterparts is assessed during the screening process for entering AG school. The new training will consist of downloadable tutorials that can be stored within each WxLR as well as kept on site for easy reference and viewed as necessary. Since these weather robots have humanistic senses such as vision, hearing and the ability to talk, instruction can be designed using video lecture, simulations and online assessments. Individual learning styles do not come into play on a regular basis in the military as the need for unit cohesion significantly outweighs the need of each serviceman or woman. Motivation will be addressed through the Navy’s promotion system that increases responsibility and prestige with advancement in rank for all its members.

***2.c. Attitudes Towards the Content and Delivery System***

Both WxLR units and their human counterparts have seen the need for accurate information while deployed to remote locations. As a result, the planned instruction is being welcomed as seen as yet another opportunity for furthering the knowledge on which observers base their weather reports. Delivery via multimedia format is considered standard operating procedures and the only main difference is that the instruction will not be accessible through satellite downloads.

***2.d. Motivation***

Advancement through the ranks of any military branch consists of two components. The first is based on military history, command structures, response protocols and physical fitness. The second component is directly related to the service member’s specialty. In this case, it would be the field of meteorology. Demonstrating proficiency levels is a part of being promoted to a higher rank. The potential for promotion, and subsequent pay increases, is a highly motivating factor among those serving in the military.

***2.e. Education and Ability Levels***

All enlisted members of the military are subjected to a battery of tests known as the Armed Services Vocational Aptitude Battery (ASVAB). The results of this test are used in determining if applicants are qualified to attend what the Navy refers to as “A” School, the first school attended after completing boot camp. Those serving as Aerographer’s Mates along with the WxLR counterparts must have achieved scores in the upper 20% in order to attend meteorology school. This qualification tool assures that the ability levels of weather trainees will not be a factor when it comes to ability to learn in varying instructional environments.

***2.d. General Learning Preferences***

The training being developed by Weather World, Inc., will mirror the standard instructional methods used in all military “A” Schools and incorporate both lecture-type delivery and hands-on applications similar to weather labs used in the past. Promotion opportunities can be quite competitive and tend to encourage some members to complete the instruction as soon as possible in order to be eligible for advancement. The self-paced arrangement of the tutorials allows those with faster learning skills to complete the lessons and actually practice new techniques and achieving mastery even sooner than some of their counterparts.

***2.e. Attitudes Toward the Training Organization***

In its forty year history of working with the military, Weather World, Inc. has maintained a professional relationship that has often been described as a “vital arm” of Navy’s weather field. As a result, Weather World, Inc.’s reputation ensures that this latest round of instruction will be well received as part of the command’s desire to improve the accuracy of weather observations and subsequent briefings when the typical means of obtaining such data are no longer feasible due to interruptions in secure communications.

***2.f. Group Characteristics***

The target population military is in large part a homogenous society due to the nature of the military, with the only real issue of diversity occurring in gender among the service men and women. Even this has been minimized over the years as both males and females have long since worked side by side with absolutely no difference in assignments, promotions or compensation. All WxLR units are equal in all manners as they are mass produced to be interchangeable as necessary.

**Design**

***3.0 Overview***

Creating instructional materials in such a way as to fully capitalize on learner characteristics is essential for the successful implementation of any lesson. The design phase of instructional development links desired outcomes with the learner populations and locations. The design must include adaptations to different learning styles and environments. Now that a need has been identified, namely that the WxLR units are lacking in real time experience of weather observations, the design phase of this project will be centered on the best way to deliver the instruction to the targeted learner. The Weather World, Inc. team of meteorology specialists, DesigNerds, are tasked with creating multimedia tutorials that can be easily replicated, transported to any location, and be delivered on a consistent basis. The multimedia tools chosen for this project consist of Pixlr for image editing; Audacity for sound editing; Emaze, PowToons, GoAnimate and Animoto for animated presentations.

***3.a. Performance or Learning Outcomes/Objectives***

The main purpose of creating the tutorial is to train the WxLR units in mastering the visual identification of certain weather elements including cloud identification. The military has asked that the tutorial be designed in such a way as to be used by both WxLRs and humans reflected in the following objectives:

1. Given a set of images, learners will correctly identify all clouds by scientific name.
2. Given descriptions of clouds, learners will correctly identify clouds by scientific name.
3. Provided with terms and definitions, learners will correctly identify key weather concepts.
4. Given current weather conditions, learners will describe possible future weather occurrences such as approaching severe weather.
5. Provided with images of thunderstorms, learners will correctly identify the stages of development.
6. After viewing sky observation skills, learners will demonstrate how to take an “ob.”

***3.b.******Instructional Strategies***

The planned tutorial will be comprised of cognitive and psychomotor aspects of learning. On a cognitive level, images will be used in lessons dealing with cloud identification and specific areas will be enhanced in order to emphasize typical characteristics that can assist in classification. When necessary for dramatic effect, zoom in options will be incorporated giving the images an animated look for emphasis. Shading and highlighting will also be used to focus the learner on important cloud features. Upon analyzing the appearance of clouds, learners will be able to interpret their findings by applying the correct label to the depicted clouds.

For lesson components requiring learners to demonstrate a psychomotor skill, audio recordings and visual presentations will be used to show step-by-step procedures. The audio component will also be designed so that it can accompany the learner during field trials prior to assessment of skills utilizing the guided response category of behavioral learning. Accurate documentation of presented weather conditions is another psychomotor skill that will be assessed as learners advance through lessons presented via animation and digital video due to the severity of such subject matter as tornadoes. Audio recordings will be made of weather scenarios such as rain showers that start and stop to simulate conditions that need to be identified and require special documentation, but are more difficult to create in an actual learning environment.

***3.c. Select Appropriate Media and Materials***

To create a truly successful multimedia tutorial, the chosen tools will need to be used in ways that best meet the needs of the cognitive and behavioral learning strategies listed above. The DesigNerds at Weather World will use image editing in the production and assembling of photos used in the tutorial. Not all cloud types are present on any particular day and still shots of cloud formations will allow for closer inspection of typical characteristics. To address this issue, stock photos available from NOAA and other sources will be used to illustrate cloud types. Image editing will allow designers to manipulate the photos by lightning and/or darkening areas to focus the attention of the learners. Sound editing will be used in a similar manner as recordings of weather occurrences such as “first gusts” and thunder are showcased to enhance the learning process when these are not actually present at the training site.

Obtaining accurate weather observation skills will be a major emphasis of this tutorial. DesigNerds will utilize digital presentations, animation and digital video applications to present material that for safety reasons cannot be demonstrated within the Weather World 1, a self-contained learning environment. The development of thunderstorms and accompanying severe weather conditions can easily be illustrated in this manner. Digital versions will include the various stage of storm development not necessarily observable prior to the storm’s arrival, therefor unobservable by the learner. Previously recorded digital videos accompanied by the sounds of extreme conditions of tornadoes and other severe events will be utilized for safety reasons while giving the learner a realistic look at such conditions.

The ability to correctly observe sky conditions is another important aspect of working in the weather field. After viewing video presentations on sky observations, learners will be recorded as they demonstrate the acquired skills. Viewing the recorded session will give the learner the chance to view and correct mistakes in their presentation skills as well as receive feedback from instructors.

***3.d. Visual Design Techniques***

Weather World’s DesigNerds will be crating the tutorial in line with the basic C.R.A.P. design elements of Contrast, Repetition, Alignment and Proximity. For the selected images, the font and color used for the text will contrast with the actual cloud image to create a distinct difference between the cloud and the instructional prompts. In order to maintain a consistent look throughout the tutorial, the design team will select one font style and color that can be used on all images. Repetition will be incorporated by placing the text in approximately the same location on the slides for ease of use by the learner. Aligning the elements within animated or digital components of the tutorial will create a clean and visually appealing overall look and eliminate extraneous distractions by presenting only pertinent information. By placing indicators such as arrows in close proximity to specific areas, a learner’s focus will be directed to important characteristics and related information linking the two instructional aspects. Camera zooms and impactful background music will be used to enhance elements of a more dynamic nature. Slide transitions and text entry options will give the tutorials a sense of organized flow.

***3.e. Assessment***

Learners undergoing training through this tutorial will be assessed at the end of each lesson. Learners will be tested on the correct identification of clouds and their responses to described weather scenarios by choosing from a list of provided answers. Improvements needed in weather observation equipment or briefing skills will be provided by immediate feedback by the on-site instructor. At this point, learner’s will be the given the opportunity to review the demonstrated lesson, hone their skills and try again. Accuracy in the field can impact military personnel and equipment. As a result, a wrong answer will automatically trigger a review session of the specific material until 100% mastery is demonstrated.

**Development**

***4. Overview***

The design phase is where the tutorial’s actual “how to” components are identified and put into place. The DesigNerds at Weather World were invited to do a site visit to one of the military’s installations. It was then that the team of DesigNerds saw first-hand the type of technology that was already available and to see the WxLR units up close. They were given technology specifics on the data processing capabilities of the units and the type of external training apparatus that would be needed. This background information was important to have up front in order to select the best media to use. The military had arranged for one WxLR unit to be placed on Temporary Additional Duty (TAD) orders become a temporary member of the DesigNerd team and to be used as a “test pilot” in military jargon.

***4.a. Software and Hardware***

Due to far reaching budget restraints and costs associated with the development contract, Weather World management has chosen to use free downloadable software applications in the planned tutorial. These applications have long established track records of reliability and ease of use. Each of them contains security features that can be upgraded to conform to the highest levels of security required by today’s military. The chosen applications are listed below along with their respective roles in the instructional lessons:

1. **Pixlr**

This is an image editing software application now easily downloadable as a desktop version. It will be used mainly for the cloud identification lessons where sections of clouds can be highlighted, darkened for visual impact, or otherwise manipulated to emphasize features.

1. [**Audacity**](http://audacity.sourceforge.net/)

This is a free audio recording and editing program that can be installed on computers. This application allows for easy recording of audio portions that can be merged with other imported tracks such as background music. It will be used to record audio instructions for cloud descriptions.

1. [**Emaze**](http://www.emaze.com/)

This is a cloud-based application that can be used to create animated presentations. It works well with presenting text and graphic images. It will be the tool used to show the development stages of a thunderstorm.

1. [**PowToon**](http://www.powtoon.com/)

PowToon claims to allow the user to create an awesome presentation in five easy steps. PowToon will be used to demonstrate how quickly weather conditions can change as the cloud cover builds with approaching storms. Cloud images will be added to achieve the desired look of build up.

1. [**GoAnimate**](http://goanimate.com/)

Animation can easily convey instruction for some of the lessons on taking accurate weather readings. By using this multimedia tool, Weather World can create a virtual classroom to deliver information that is presented in text and audio form similar to today’s version of a webinar. Cartoonish characters can move and give a more humanistic feel to the presentation. Instructor characters will give lessons on the different types of precipitation.

1. [**Animoto**](https://animoto.com/)

This type of application will be used to create a digital video that describes using visibility markers to assist in taking correct observations. This application allows for videos, assessment questions and answers to be included in the presentation as well.

***4.b. Pilot Testing***

As mentioned earlier, the military has assigned a WxLR unit TAD orders to Weather World, Inc. to work along sing the DesigNerd team. The assigned personnel will test-pilot the tutorial along with three of its human military counterparts, three senior Weather World staff members, and three graduate-level college students. Each test-pilot subject will take a pre- and post-test on the subject matter being presented. All participants will maintain a daily blog during the instruction as well as submit individual lesson feedback via anonymous surveys. Built in assessments will be monitored in order to identify possible areas of concern and to allow for modification of instruction as needed. Seeing as training time is often limited due to mission objectives, completion times will be closely monitored and materials adjusted if necessary.

Upon successful completion of the pilot study, the instruction will be dispersed to all WxLRs serving in the fleet. Instruction will be tiered so that competency in one level must be attained prior to advancing to the next level. The tiers will be presented in two phases with the second phase including actual visual observations. Humans used as Phase II instructors will be trained in observation skills prior to meeting with the robots. While these tutorials will be self-paced lessons to allow for both AI and human learners, they also provide schedule flexibility as needed due to service-related duties such as standing watch.

***Implementation***

***5. Overview***

 The Weather World team of DesigNerds has developed an interactive tutorial to teach “old school” methods of weather observations to artificial intelligence units called WxLRs. These units serve alongside their human components in a military force dealing with advanced technologies by bot h friend and foe. Due to an increasing occurrence of communication disruptions, weather observers will now need to know how to take accurate observation without relying on satellite delivered information. Implementation of the actual tutorial will allow DesigNerds to demonstrate the adaptability of the training as well as the effectiveness of providing instruction via multimedia educational tools.

***5.a. Training Environment or Setting***

 As mentioned previously, training will take place within Weather World 1, a self-contained learning environment. This first unit was only used at Weather World’s headquarters in Lakehurst, New Jersey. After three years of successful use of the first prototype module, twelve portable models have been built in order to take part in the implementation of instruction. The modules are named Weather World 1A-1L and have been delivered to deployed commands around the globe. These modules are each equipped with state-of-the-art audio and video components that fully support the intended materials. Mimicking weather occurrences within a controlled environment allows the learner to focus on the actual lesson objectives and minimizes extraneous information and distractions.

***5.b. Supervision***

 Each training session will include the learner, a military instructor and a DesigNerd team member. The instructor will evaluate the learner’s proficiency level for all required skills and provide additional instruction and feedback as needed. The DesigNerd team member will monitor the actual performance of the multimedia tutorial by tracking start and top times, areas needing additional clarification and any performance issue with the training materials. Adjustments will be made for schedule limitations and to provide performance feedback to the learner. The DesigNerd team member will also offer assistance in weather observation basics as needed.

**5.c. Delivery Format and Activities**

 Lessons on the use of weather observation instruments such as the sling psychrometer will be providing via audio recordings. Recorder lessons give the learner the opportunity to proceed at a comfortable pace and review steps as necessary. After listening to the steps involved in taking accurate readings, learners will demonstrate the proper procedure for placement of the wet bulb sock, rotation of the instrument for the specified time, and accurate reading of both the wet and dry bulb thermometers. Animated presentations are available for learners desiring a more visual component to the lesson. Weather briefing skills will be taught via a combination of historical audio recordings, learner created presentations and aural presentations. Listening to experienced briefers will provide the learner with examples for comparison. Most of the lessons rely on visual cues for accuracy. Severe weather occurrences that would generally be too risky to observe in person can be recreated within the confines of the module. Video is the best tool for illustrating time lapsed cloud development and storm stages and these lessons will utilize Weather World 1’s technology to its fullest. The interior walls of each module serve as large screen monitors in a 360 degree format, much like actual sky cover. There is not one way to proceed through the series of tutorials, so learners can base their choices on lesson and or off duty time that is available.

**5.d. Time and Length**

Allowing for individual differences in learning styles between WxLRs and their human counterparts, training is estimated to require approximately 4 hours to complete if all lessons are completed in succession. The training schedule will be controlled by each command’s designated Training Officer (TO). Each TO will be responsible for scheduling learners during off-duty hours. This will eliminate disruptions to normal operations. If necessary, training can be offered at any time of day or night.

**5.e. Assessment of Pilot Testing**

To assess the effectiveness during the pilot study, instructors and learners will be given separate pre- and post-tests to measure ease of tutorial implementation and acquisition of required skills respectively. Both groups will be asked to rate their perceptions of using a multimedia tool prior to delivery of the instruction by answering survey questions relating to design appeal and appropriateness of materials using a Likert scale. Formative assessment will occur after the completion of each lesson. The instructors will answer questions regarding the time involved and to identify possible areas of instruction needing improvement. Learners will complete content area assessments at the end of each objective-based lesson either by skill demonstrations, presentations or responses to questions. Instructors will track and monitor test scores on a spreadsheet listing start/stop times, responses to all questions and any program issues that delay training. Learner opinions will be tracked via surveys and feedback will be encouraged through a comment posting section at the end of each survey.

All instructors and learners will attend a single summative assessment de-briefing session as the last stage of the pilot testing. DesigNerds will lead the de-briefing session and solicit feedback on improvements as well as suggestions for future instructional lessons. This debriefing will start off with a two-hour open discussion about the pros and cons of the designed instruction. Similar to a brainstorming session, comments will be documented by the lead DesigNerd. The debriefing will conclude with the attendees competing a questionnaire that rates from 1-5 (1 being the best): 1) the appropriateness of instructional materials; 2) effectiveness of instructional materials; and 3) the time requirements to complete the lessons.

**Evaluation**

***6. Overview***

It would be of no use for the DesigNerds at Weather World, Inc., to produce and deliver instructional materials that failed to meet the previously stated objectives of the military. Summative assessments will be conducted to gather feedback from all parties involved. This evaluation section will focus on the assessment tools and results. Training times were approximated to take 4 hours at the most from start to finish and that proved to be a reasonable expectation. WxLR units did not required the same completion times as their human counterparts as was expected. It took 6 months for a select group of 3 command locations to receive the designed training and to train all personnel. Assessments of WxLR units were limited to only objective aspects.

***6.a. Sources of Evaluations***

During the pilot study, separate assessments were given to everyone involved in two main groups, instructors and students. Different pre- and post-tests were administered according to the categories. Each group consisted of both regular military personnel and WxLR units. Instructors were asked to rate the ease of delivering the instruction and how well the learners responded to the tutorial’s design. One result of the pilot study debriefing was the identification of a command location that consisted of six NOAAA meteorologists taking part in a joint task force training exercise involving well over fifty participants who would be classified as learners, creating a much larger feedback group. The NOAAA representatives were counted as instructors and their input as civilian experts in meteorology proved to be invaluable. Learners were again asked to demonstrate the acquisition of required skills. All participants were instructed to provide feedback based on the use of a multimedia tool prior to delivery of the instruction. The survey instruments previously used in the pilot study were used with this large group to expand the reach of the evaluation phase. Similar formative assessments occurred throughout the training process and identified content areas needing immediate correction such as outdated information. The data provided via the established summative assessments gave the DesigNerd team an overview of the effectiveness of the instruction as outlined in the next section.

***6.b. Instructional Effectiveness***

A Lykert scale was used so that instructors could rate the effectiveness of each instructional component and how well it met the stated objectives. As part of a self-administered paper survey, the instructors in this joint task operation were asked to score the following areas:

* Ease of setting up training environment
* Ability to adapt training schedule to command needs
* Time needed to complete instruction
* Overall effectiveness of lesson

The results of these surveys showed that more than 80% of instructors had little to no problem with setting up the training environment. It was determined that the 20% who responded with negative ratings were doing so based on poor communication prior to the arrival of Weather World 1, a problem that has been addressed through the proper military channels. Once the learning environment was set up, overall scores indicated complete satisfaction with schedule adaptability and the actual time required to train personnel. The instructors gave the entire training scenario a score of 90%, well within acceptable military parameters when compared to other instructional methods.

Students were given a similar scale to rate the actual experience of learning:

* Ease of use of instructional materials
* Ability to retain new information presented
* Time needed to complete instruction
* Overall impression of instruction

Student survey results indicated an overall rating of 95%. Learners responded that the instructional materials were easy to use and found it to be a more pleasant experience than traditional lectures. Completion times received a less, but still acceptable, rating of 75% due to the fact that training was scheduled for off duty time. A few learners wrote that they were not happy about giving up what is typically very rare, their free time.

Focus groups representing the both categories were held to openly discuss the concept of this type of training and possible additional offerings in the future. This information would be passed along to the individual commands for further consideration.

***6.c. Instructional Appeal***

At the conclusion of each focus group, volunteers were solicited to provide additional feedback on the design appeal of the instruction. This would be handled though individual interviews involving a panel of 2 or 3 DesigNerd team members. Volunteers were asked to sign up for one of two choices based on their familiarity with using multimedia tools, novice or expert. The novice group almost always identified all of the bells and whistles as the most impressive part of the instruction. When the actual learners were asked to answer a question on the instructional appeal of using multimedia tools, 100% responded that the format used was more appealing than anything they had ever experienced. They were eager to use the newly acquired knowledge in field exercises on a regular basis.

The expert group, on the other hand, were familiar enough with multimedia tools to look past the “wow” factor and take a closer look at the design’s actual appeal. 60% of these interviewees commented that the narrative component of the training appeared at times to contain not enough military jargon. They were in agreement that while the DesigNerds knew weather, they could learn a thing or two from their target audience when it came to appropriate terminology.

***6.d. Instructional Efficiency***

Command locations were asked to analyze the costs involved in this type of training from the acquisition of the portable learning environment through the training of all personnel. Cost was measured in terms of budgetary impact, lost time and man power. Base personnel were also asked to consider expanding the scope of instruction be offering it to their local civilian counterparts as an act of cooperation during joint task force maneuvers. Financial costs would also include the possible need to retrain personnel or to update the knowledge base of learners as warranted by the military.

This efficiency analysis brought to light a more suitable training schedule. Instead of holding training sessions during off duty times for personnel, one command attempted to schedule all training modules during specific time slots on regular night watches. After consulting with the base Operations Officer, it was determined that instruction could be spread out over the span of three consecutive night shifts during the hours of 3:00AM to 4:30AM when relatively little else was going on in the weather office.

This idea was fully supported by all involved as it meant not having to give up their free time. This proved to be quite a morale booster for those working long shifts. Word was quickly spread via a command to command message and interest in the training increased dramatically as morale was boosted by the scheduling flexibility. Financial costs were deemed within feasible ranges as the larger number of learners attending the training drove the costs per individual down.

***6.e. Revisions and Changes***

In direct response to the military’s request to have WxLR units and their human counterparts to receive basic weather observation training that does not rely on information received from satellites, Weather World, Inc. has developed a series of tutorials that can be delivered in a mobile learning environment known as Weather World 1. The instruction was designed to provide training in visual observation skills similar to those used during the 1970’s. These mobile learning environments were deployed to U.S. command posts throughout the world in a pilot test to gauge the instructional efficiency and effectiveness of the materials when used in remote settings.

 While there were a few minor tweaks to the size of certain graphic images contained in the lessons, the major changes needed revolved around the when the training would occur. As was previously stated, free time was a luxury that not many military personnel are willing to give up. A training schedule was devised that allowed for the lessons to be spread out over the course of three night shifts during optimum times for training of this nature. Training officers at the different commands would be sent additional materials containing suggestions as to which training modules worked best together so as not to interrupt the instructional design.

Due to this change of when training would take place, the DesigNerd team was tasked with rearranging the contents of the lessons. With training now taking place at night, the planned daytime observation drills would now be delivered through animated presentations like those planned for more serious weather conditions. Videos of daytime conditions would be added to the lessons. Lesson components that dealt with nighttime observations could now be offered without relying heavily on supplemental materials to simulate those conditions. By switching from a daytime delivery focus to a nighttime focus, the DesigNerds at Weather World, Inc. remain confident in their ability to meet the needs of the military by providing weather observation training that can easily adapt to both the technical requirements of meteorological knowledge and scheduling demands.