MIT 513
Group Project
The Plant Life

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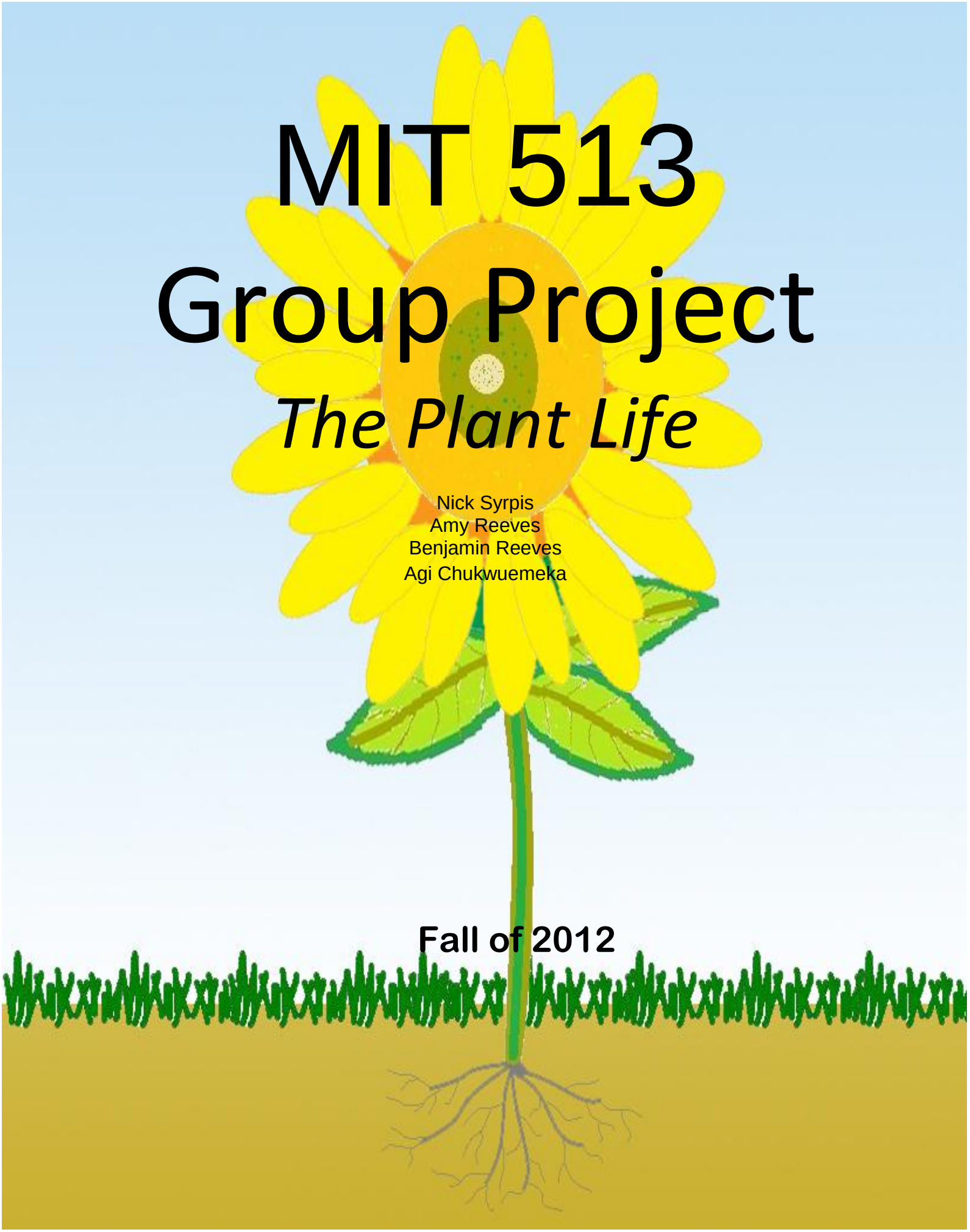

Fall of 2012

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BACKGROUND:

Elizabethtown Primary School, that team member Amy Reeves works for, was evaluated through on-site observations and personal interviews. The data was collected and analyzed and the client needs were assessed. It was concluded that Elizabethtown Primary School is working to improve its technology integration into education by purchasing laptops and iPods for instruction. Currently it has the purchased technology; however, the materials and resources available for the new common core state guidelines are minimal.

This year, 2012, North Carolina has adopted decided to remove the North Carolina Standard Course of study standards from the curriculum and has adopted the National Standards to follow in the classroom curriculum. The name for this new standardized system is the common core essential standards. In doing this and looking at the state funding that is currently available for local school systems they did not add to the budget the necessary costs for materials that would assist teachers in preparing for this new curriculum. As a result this led to the problem of the schools currently having no new materials or textbooks to help in this adaptation of the program.

Elizabethtown Primary is in great need of programs that follow the new curriculum and without the money availability this is a definite task. We feel that creating a self-directed, computer-based learning module would benefit the school by taking advantage of their existing technologies, and help by aligning the common core curriculum into instruction, would address our client's needs. Moreover, doing so would mitigate any constraint that we may face.

OUR CBI DEFINED:

What we created is a Computer Based Instruction (CBI) module that caters to 3rd grade students. It is a module that is completely self-directed, without any type of adult supervision necessary, and is completely disseminated through a computer based deliver system. It involved necessary content as prescribed by state regulations, and delivered that content in a fashion that would be appealing to younger students. It used age appropriate language, images that were appealing to that age group (some of which seemed as if it were designed by a similar age group to create a sense of peer learning and a scaffolding effect), an energetic and soft voice for narration to encourage the learner and help keep them engaged, and simpler but relatively challenging assessments for people of that age. The navigation was also easy to follow and gave the learner much flexibility to create a Montessori type of approach to creating a learning environment. At the end of the module, the learner is rewarded for their participation, giving them a sense of accomplishment.

Advantages

The advantages of this approach were simple. First and foremost, it addressed the needs of the new mandatory curriculum. It also utilizes the client's resources efficiently and effectively. It accommodates the learners really well. In all reality, it can be used from anywhere and at any time if school administrators so choose to deploy this lesson in such a manner. Finally, it provides instructors with a viable option to facilitate learning for that those objectives.

Disadvantages

Unfortunately, the content provided did not allow for much opportunity to provide the younger learner with a take-home section. For example, to ask the young learners (in this case, about 8-year-olds) to work with fertilizers and other materials that were either hazardous or difficult for people their age to come by without the assistance or supervision of an adult would have made this product no longer a true CBI. This limited the designers' options with when it came to choosing an instructional model. It also somewhat limited the potential for providing more experiential learning opportunities for the learners solely through the use of CBI.

METHODS:

We analyzed the new common core standards that were given to the educators of North Carolina and chose to create a CBI for Science Essential Standards Ecosystems from the NC DPI guidelines. After reviewing and studying this section of the science standards we looked at the goals that we had to meet in order for our learners to be successful and knowledgeable in this area. We analyzed and applied our knowledge to determine what would need to be met in order to encourage students learning and successful achievement of each essential standard under the ecosystem category.

According to the new standards for 3rd grade standard 3.L.2 Understand how plants survive in their environments, we followed each objective in the creation of our storyboard and eventually the development of the CBI. We studied each of these carefully to ensure that we were going to be able to accomplish each objective and help

the students with mastery. As we used these guidelines, we developed a storyboard of the Plant Parts, Plant Environment, and Plant Life Cycle. We researched and applied information in the storyboard that would accomplish the goals in the Ecosystem standards. In order to develop the final draft we used the Adobe Flash Program to design and develop this CBI. Each page for the flash was developed based on the essential standard guidelines and storyboarding that we had completed. Also sound files were created to apply to the lessons being taught within the program.

The CBI starts out with an introduction telling the learners exactly what to expect and what they will be able to do at the end. Then a brief "how-to-use" slide is incorporated. It tells how long the module normally takes to complete, what you will need to take it, and how to use the various navigation buttons (which we considered as user-friendly). As they start the lesson, rhetorical questions are asked to stimulate the learner's mind about plants. For example; what do you know about plants? How important are they to us? This was designed help them bring out any prior knowledge about plants and at the same time leave their minds open as to how or what to look for in the lesson to answer these questions. During the lessons various graphics were used to enhance learning.

When designing the lessons, various multimedia principles were considered and followed. Zone of Proximity was featured in every aspect to ensure that the learner would not miss important information. In almost every lesson, we took advantage of some of Flash's features; motion tweens, masks, dynamic text box's, invisible buttons, and timeline insertion points. At the end we added a quiz to test what the student had learned from each section. When the student finishes the quiz, they come to an end

slide which congratulates them. Finally, there is a credit screen which has all the links to images that were used and not created by us.

Instructional Model and Theories

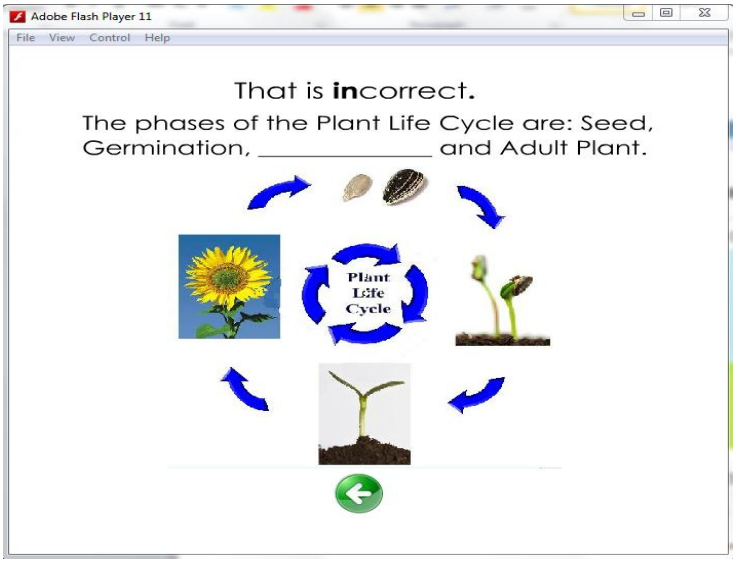
When it came to designing this product, it was necessary for us agree upon as a group was the instructional model that was to be integrated into the CBI. Research was performed to find models that fit well with the type of delivery method agreed upon and several were discovered. Among these were Gagne's Nine Events of Instruction, Merrill's Component Display Theory, and Keller's ARCS Model of Motivational Design. Though Gagne's model seemed fit well into our design, we decided to combine Keller's and Merrill's models early on in order to help ensure efficacy. But as more was learned about Merril's model, a decision was made to adopt Robert Gagne's Nine Events instead. This decision was also later revisited as the storyboard was adjusted during the design phase. It was then concluded that exclusively using the ARCS model would be the most effective instructional model for our product.

Because the end user, or target audience, for this instructional module is to be third graders, we felt it necessary to focus on motivational strategies in particular. Though Gagne's model did address motivation to some degree, we felt the Keller's ARCS model did a much more thorough job of it. This model consists of Attention which focuses on learner curiosity and arousal, Relevance which aims to address why the learning is important, Confidence which encourages creating "conditions where [the learner does] not have to fear loss of face or embarrassment, (Keller & Kopp, p 293-295)" and Satisfaction in which focuses on intrinsic motivation and extrinsic reinforcements. We used all three types of Attention (Perceptual Arousal, Inquiry, and

Variability) from the offset. We also triggered Relevance by using art type and language familiar to children of that age, and by embedding goals within the module. Confidence and Satisfaction were utilized by performance benchmarks and through feedback prompts (Keller & Kopp, 1987).

We also felt like that it was important to incorporate the dual-coding theory of multimedia learning (Multimedia learning occurs when students use information presented in two or more formats). In our design, we chose to use visually presented animation as well as verbally presented narration to help the learner construct a mental representation of both visual and verbal items in their working memory, thus making a referential connection between the two. We also avoided any Cognitive Load problems by only using audio narration and text together with images displayed if the text was merely used to label the images alone. When there was much text coupled with images, then no audio narration was utilized.

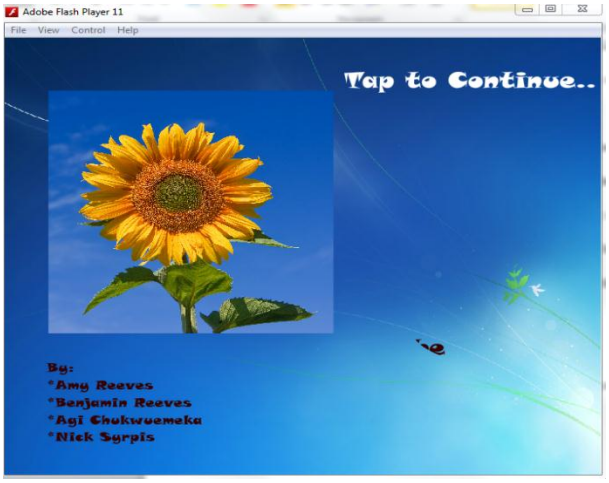
The Problem Completion Effect was included in the instruction, specifically in the quiz at the very end of the module. When the user or learner responded to a multiple choice question with an incorrect answer, they were directed to a clip that provided them of an image from where the learning of that particular content first took place. They were also provided the correct answer, but with part of it missing. This forced the learner to recall the missing information using only the information provided, thus continuing the learning process for them. The learner was then able to go back and select the correct answer. See illustration below for an example.



Applying Dual Coding to this program helped to address the diversity of students within the third grade. There are many students who would be unable to read and interpret the information due to a language barrier or a learning disability within the reading curriculum. With Dual Coding we are able to help these students as well as the other attain the information and they are given visual cues that will help them have an understanding of what they are seeing. With dual coding it is very beneficial to learners who would otherwise interpret this information in an undesirable manner or even become confused by the information. It is proven that students, especially ESL students, learn better when you are giving instruction with words and picture modality rather than with just words or with just pictures. This in turn is a key reason for implementing this CBI with Dual Coding in mind.

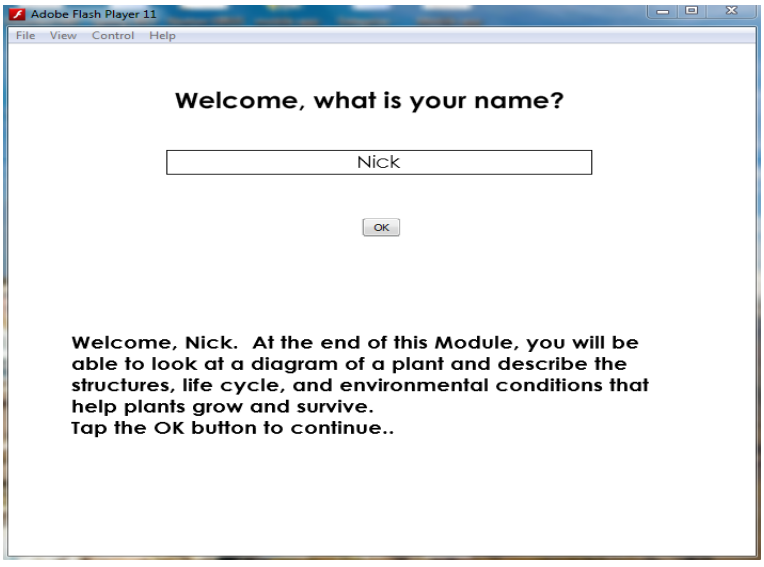
ARCS Model Integration

John M. Keller's ARCS Motivational Model became the focus in our design. From the onset, the user gets drawn in by the first strategy from his model called

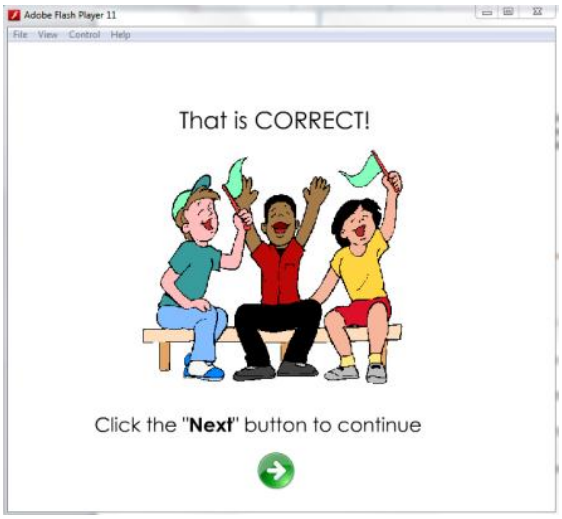


Attention. Specifically, Perceptual Arousal was deployed by the use of a randomly moving mask that is flashy and intriguing, and with random and rapidly moving wording. This same feature is also the first time we see the Inquiry Arousal component because it forces the user to become curious about what exactly is being masked. Finally, Variability is utilized by making some dissemination approaches slightly different.

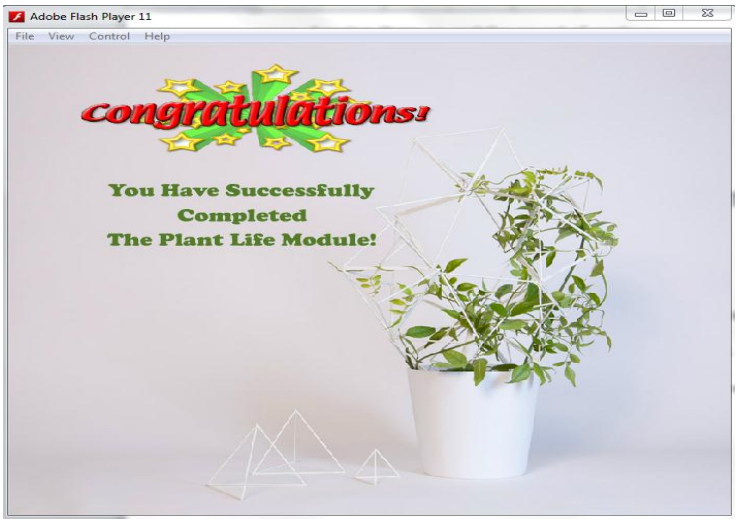
The second strategy from the ARCS model is Relevance. The first component, Familiarity, was used with visuals that seemed to be created by 3rd graders, with tone in the narration that is appealing to their age group, and with language that was at their reading level. Goal Orientation was also used by presenting the learning objectives to the user early in the module.



The third strategy from the ARCS model is Confidence. This into was built into the language from the clip shown above. The Challenge Setting was established by presenting easier content and questions first, and gradually building on the difficulty level. Finally, attribution molding was used throughout, but especially with the quiz questions at the end. There, when the learner guesses the correct answer, they are greeted by an illustration of their peers cheering them on and the sound of applause.



The last strategy from the ARCS model that was used is Satisfaction. Equity was used by keeping the standards and consequences to the built-in tasks consistent (Keller & Kopp, 1987). Positive Consequences was used by offering positive reinforcement such as the clip shown above, but especially by the last slide which is displayed after the learner completes the module.



CONCLUSION & RECOMMENDATIONS:

There will be five Third grade classes using the CBI. During the implementation of the CBI, students will have the option of using it on iPads, iPods or they may be taken to a computer lab at the school. They will go to the school website teacher page and will download the program from the website. They will then begin their computer based instruction. They will self-guide through the lesson and will work at their own pace to complete the CBI. At the end they will receive a certificate of completion.

A formative evaluation can be conducted by using a small group comprised by randomly chosen students and data collected from their feedback can be used to implement any necessary changes to the module. In this process, though behavioral type objectives can be much easier to assess, for the sake of this student project, an approach to assessing learner motivation should be developed and doing so should not be underrated when it comes to effective instruction in general. "The assumption all too often has been that if instruction is of good quality, motivation will take care of itself. Unfortunately, this assumption has been found only to be partly true. It is true that one consequence of motivation is to contribute to better learning …another consequence of motivation is intensity of performance at a task" (Keller, p 388).

Works Cited

Keller, J.M., & Kopp, W.K. (1987). An application of the ARCS model. C.M. Reigeluth (Ed), *Instructional theories in action: Lessons illustrating selected theories and models* (pp. 289-320). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Keller, J.M. (1983). Motivational design of instruction. C.M. Reigeluth (Ed), *Instructional-design theories and models: An overview of their current status* (pp. 383-434). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.