Children's Weather Website

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INTRODUCTION

As a college student that walks to and from class everyday, it is always important to be aware of the weather forecast. This allows you to know ahead of time if it is supposed to rain and lets you avoid sitting in class with wet socks. I did not start following the weather until late high school or early college. I think that it is important to be knowledgeable of the weather for a number of reasons. There is the obvious reason of any impending disasters heading your way, whether it be a flood or tornado, because it is important to know when to stay indoors or seek shelter. On most days, one can observe someone who is incorrectly dressed for the weather. This could be someone wearing shorts in the middle of winter, a parka on a hot summer day, or running through the rain without an umbrella. All of these situations pose dangers to the individual, from a common cold to heat exhaustion, dressing appropriately is important for staying healthy.

MOTIVATION

Research has found that children spend more time outdoors in the summer time than in the winter, and they also are slightly more active when there is light rainfall (Medicine & Science in Sports & Exercise). 39,782 children were polled in a particular study, finding that over half had a less severe form of the common cold in the past year, with smaller percentages having increasingly more harmful cases of the common cold (Norbäck et al.). Children with an average age of 4.3 years old were examined in terms of daily physical activity. It was found that parents are increasingly afraid of letting their children play outside and do not believe in the importance that health care providers stress for physical activity (Tandon et al.).

GOAL AND REQUIREMENTS

With the previously stated factors in mind, my specific goal was to educate children about weather so they can be more prepared for it as life goes on. My target age is around five years old, in hopes of teaching how to be prepared early on. As with any weather website, it was important that the user could easily access the weather information. In addition, I wanted to offer a learning experience for the user and not just a place to check the weather. I also wanted to include an outfit selection game to help illustrate what clothing should be worn in specific outdoor conditions.

LITERATURE REVIEW

Work by Boudourides highlights the idea of what he called "the intuitive child", which takes place between ages four and seven. In this stage, the child "forms ideas just from impressions and the child cannot consider more than one variable at once" (Boudourides). Studies like those done by Read and Panos have enforced the need for specialized child

usable versions of adult oriented websites (Read and Panos). Some websites catered toward adults prove too difficult for young children to comprehend, such as weather websites that often display an overwhelming amount of information. A study conducted by Harlen and Wynne examined teaching young children science, with part of their study including computers. They found that when integrating computers with their lessons, children tend to ask more questions. They also stressed the importance of having an adult around to field such questions to maximize the learning experience of the child (Harlen and Wynne). Further research also supports the claim that games help boost children's learning, this study specifically promoted learning motivation (Bourgonjon, Valcke, Soetaert, and Schellens). Jones urges the use of technology because of its ability to "motivate students to acquire knowledge and encourage the need for increased speculative activity, which involves solving problems and conscious application of knowledge in new situations" (Jones). He also indicates the positive outcome of a child's computer literacy increasing from techniques such as these (Jones). Charsky and Ressler claim with their research that games that have educational tools are the best way to help a child learn a topic (Charsky and Ressler). More specifically, concept map-embedded digital games have had the results of increasing a child's learning while decreasing their "cognitive load" (Hwang). This is an interesting finding because it shows that by using these techniques of teaching, children can learn more while working less. Arguments for computer usage in the teaching of children include "Internet connection for searching and consulting a variety of databases. With the help of this technology, teachers and students can also try to form their own libraries and repositories of knowledge" (Stanojević et al.). Many of these studies state that their results could be due to the games they used, but they all had positive outcomes which shows a positive trend in the implementation of games in educational learning.

TECHNICAL DESCRIPTION

There are many technical aspects that go into a project of this type and scale. The pages that are seen by the user consist of HTML elements. The pages are sectioned off into banners, address bars, and page content. Page content varies between educational tabs and the home page that displays the weather. The educational tabs are half text with an embedded video for reference, while the home page has the weather displayed alongside a visual aid and an outfit selection game. Images are placed in the HTML by linking photo files, such as jpeg or png. The contents of the HTML elements are fine tuned and styled using CSS while the functions of buttons, and other non-static mechanisms, make use of scripts. These features are then connected to a database by using a Apache/Tomcat server. The database has a couple test locations entered into it and hosts a single table containing information necessary to populate the home page. Servlets have been added to the project so users can search the database for new locations. All of these technical aspects allow the website to run, giving the user a number of features to interact with.

Weather for the current and next day are displayed in terms of highs and lows, as well as the current wind details. A longer forecast was not supplied because this would clutter the page and reduce readability. An extended forecast also loses its value the further out it

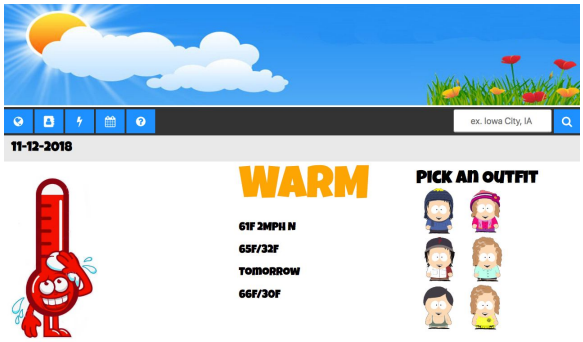

Figure 1. Weather website home page.

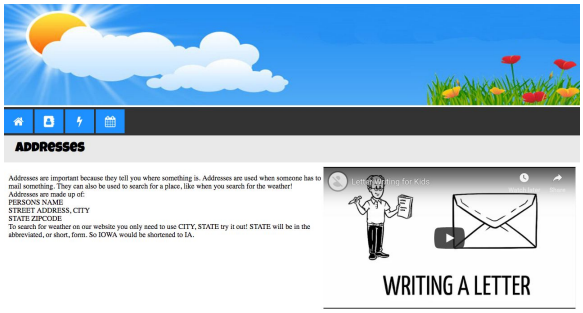

Figure 2. Weather website education tab example.

goes, another reason for only including two days. Users are allowed to search the weather for different locations, this is currently restricted to a specific format of "City, STATE". An outfit selection game was implemented to increase the interaction of users. This game has users select an outfit for the current temperature and weather conditions. After a selection is made, the user receives a prompt indicating the correctness of their choice. Another feature of the website is education tabs for users to explore and learn. Although the contents of these tabs need improvement, the current state offers an idea of what is being aimed for with this feature.

QUALITATIVE DESCRIPTION

The prototype needs a substantial amount of work before it would be at the final version, but is overall of a high quality. The layout and themes used for the prototype are what would be used in the final version, such as: fonts, font sizes, icons, and general layout of elements. I am also satisfied with the image size, though the images themselves would need to be replaced. More thermometer images are needed for additional weather conditions (warm, cool, snowing, raining). The website would need to have its own artwork created that matched the cartoon theme it currently portrays. South Park avatars are used in the prototype, which is problematic for two reasons. South Park is a copy written franchise and also geared toward a much older audience than the website's. It was never my intention for these characters to be used in a final product, but rather just in the prototype. They fit in with the aesthetic and offered a character creator that was perfect for displaying different outfits. The character creator also made it very easy for the background to be removed, which was needed for the website's outfit selection game.

Some of the website's functionality would also need to be addressed before the final version. There is currently a toggle for changing the temperature scale between fahrenheit and celsius but it does not work. The database's tables should be made more efficient and include any additional condition descriptors. As previously stated, the educational tabs would also need to be rewritten before launching the website. The terms that are currently on the tabs may be from too high of a reading level for the target audience.

POSSIBLE IMPACTS

The content of the website could be divided into two

sections, the home page and the educational tabs. The aim for the home page was to display weather in an effective way while increasing interaction and interest by including the outfit selector. By using the outfit selector, children's ideas of what is okay to wear in various outdoor conditions should improve. Users should also be able to start tying numerical temperature ranges with the feeling of warmth they experience outside. A more ambitious impact would be learning the difference between fahrenheit and celsius through experimentation with the temperature scale toggle. The goal of the educational tabs were, as the term states, to be educational. Four subjects: addresses, geographical location, dates, and natural disasters offer a range of important weather related information. Addresses and geographical location cover the format of location labelling and how weather varies depending on one's position on the globe. Dates focuses on how the weather tends to follow patterns with the changing seasons. Natural disasters touches on several types of disasters and warns of their dangers.

DISCUSSION

A number of features were forced to be excluded from the prototype because of our time constraint. The most important feature to be cut was a character creator. The character creator would be implemented with the outfit selector so the user could play the game with a custom avatar. A possible result of this feature could be increased interest because of an attachment to the created character.

COMPETITIVE ASSESSMENT

A competitive assessment was conducted during the development of the children's weather website. Two websites were focused on in particular, NASA's ClimateKids and KidsWeatherReport. ClimateKids exhibited a lot of things I wanted to accomplish with my website's educational tabs. ClimateKids uses an address bar that consists of very large and colorful buttons with icons, rather than text, indicating their topic. I liked this implementation and incorporated some of these ideas into my website, using large icon buttons with no text. ClimateKids introduced some more complex topics that I determined to be either too challenging for my target age or not pertaining to weather closely enough, such as atmosphere and energy. ClimateKids also went more in depth with their topics, having several subcategories for most categories, something I did not wish to do since my main focus was introducing weather and forecasting.

Figure 3. ClimateKids screenshot.

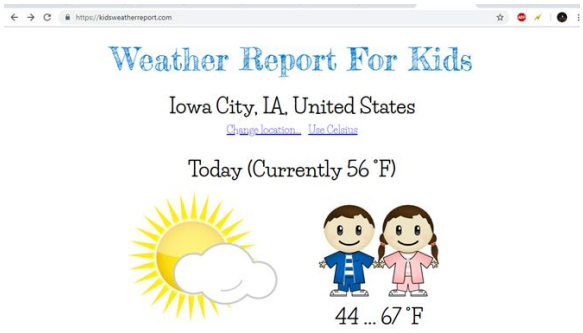

Figure 4. KidsWeatherReport screenshot.

KidsWeatherReport was a great example to look at before starting development because it had many of the ideas I envisioned. This website mainly displays the weather in terms of images. Information on this site included the current temperature as well as the high and low for the current and next day. Something unique to this site was how it included male and female avatars that were dressed for the current weather. I found this interesting because it was similar to what I wanted to implement with my outfit selector. With my website, I wanted to offer new ideas and my version of the competitions ideas, all in one location.

CONCLUSION

Although there are many things that need to be changed, or added, between this and the final product, this is a prototype. I surpassed my own expectations and created an aesthetically pleasing website with many features that I imagined the finished version would include. This website could be used by teachers or parents to introduce children, around the age of five, to weather. Furthermore, many aspects of this website are the result of studying child computer interaction. My project is an example of a website type commonly gauged toward an older audience but reinterpreted for children.

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