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DES 157
Background Research

      I am interested in the topics of designing for diversity - more specifically, the design of applications that address the needs of students with mental illnesses/learning disabilities. For my background research, I decided to delve more into specific learning disabilities as well as existing strategies and key tips used to aid students in the classroom environment. I also tried to find any applications that are used by those with learning disabilities. I have not yet decided whether I will focus mental illness or learning disabilities but since learning disabilities is an area that I am less familiar with, I looked more into AD/HD and dyslexia and researched their characteristics and similarities.

      Dyslexia is a learning disability that involves general difficulty in reading/interpreting words and letters but does not affect one's general intelligence in other areas. AD/HD, on the other hand, is a learning disability that is most commonly characterized by inattention, hyperactivity, and impulsivity. The two conditions tend to overlap and though they are not caused by one another, oftentimes individuals may have both. Genetics plays a role in both conditions. In terms of similarities between the two, dyslexic individuals can have difficulties paying attention to reading because it is so demanding, just as individuals with AD/HD would struggle with maintaining concentration. Both people with dyslexic and AD/HD conditions typically have trouble with writing as well: AD/HD individuals struggle with proofreading and and organization just as dyslexic individuals do. Especially in the classroom environment, these conditions tend to deter otherwise bright children - because of their struggles in keeping up with the curriculum as well as their peers, they become unmotivated and lose self-confidence.
According to many studies, however, both dyslexic and AD/HD students are usually able to successfully adapt to their conditions. In fact, about 40-50% of children after puberty with AD/HD or Dyslexia are able to develop coping mechanisms well enough to be successful (attend grad school, secure a career). The other 50-60%, however, may be negatively affected by their conditions for the remainder of the life.

      After educating myself more closely on these conditions, I then looked into classroom strategies recommended by teachers as to how these students' unique learning capabilities might be addressed. I found that, in the teacher/professor's perspective, it is most important to realize that learning disabilities are not an intelligence indicator nor a result of a behavior issue - they should/need to be correctly identified and treated as such. The progress of students with learning disabilities should be examined at each of the 4 stages of learning, which include input, integration, storage and output.

      Next, I then examined existing interfaces that aid students with learning disabilities. These apps, to list a few, include 'ModMath', 'MyTalkTools Mobile', 'Dyslexia Toolbox', 'Voice Dream Reader', and 'Stop, Breath & Think'. 'ModMath' is a

free app that is targeted more towards students with dyslexia and dysgraphia. It is a tool that helps students solve math problems without having to physically write out a problem/solve it on paper. 'MyTalkTools Mobile' is a more innovative application that allows students to express themselves and communicate using anything from a combination of words, sounds, and images. 'Dyslexia Toolbox' is an app that was created by dyslexic people for dyslexic people, featuring a variety of useful tools such as word prediction, text readers, digital overlays, and type pads. The 'Voice Dream Reader' is an application designed for students of all ages with AD/HD or reading disabilities. It allows users to highlight text then have that text read back to them. And lastly, 'Stop, Breath & Think' is a meditative app that helps students destress and relax by prompting them to think about how they feel.

  In addition to these applications, I found out more about features online that serve to help people with learning disabilities navigate a web page, like a screen readers, language translators, audio recording tools, page simplifiers, text magnifiers, and screen masking tools. I began to consider how, through javascript librairies and plug-ins with audio input, these features might be implemented.

Sources

"Atttention-Deficit/Hyperactivity Disorder (AD/HD) and Dyslexia." *Dyslexiaida.org*, International Dyslexia Foundation, dyslexiaida.org/attention-deficithyperactivity-disorder-adhd-and-dyslexia/.

Lynch, Mathew. "7 Must Have App and Tools for Students With Learning Disabilities." *The Tech Edvocate*, The Edvocate, 6 Aug. 2017, www.thetechedvocate.org/7-must-app-andtools-students-learning-disabilities/.

"The Five Most Common Learning Disabilities Seen in Schools Today." *University of Cincinnati Masters of Education Program RSS*, University of Cincinnati, mastersed.uc.edu/about-us/.