The International Network of STEM for the Blind and Low-Vision Newsletter
2022 June (Second Issue)

Founder's Word

Dear readers,

I hope this newsletter finds you well!

While we are in the process of getting registered as a tax-exempt organization to further carry out the network's mission, our current work focuses on sharing information and exchanging ideas to facilitate the growth of the field. We look forward to doing more work, including organizing events for our members, after the network becomes official.

I appreciate your support and patience as we continue this process. At this stage, we will continue to add content to our website, post information on our forum, and release newsletters when we have new updates to share with you!

In this newsletter, there are a few new updates and reminders, as listed below. Our co-founder, Dr. Mustafa Şahin Bülbül also shares his story about how he entered the field and what he did to develop his expertise and gradually become an expert in science education for visually impaired students. I hope you enjoy reading it!

Sincerely, Ting

New Updates and Reminders

1. We have compiled many resources related to STEM for the blind and low-vision (BLV) and made this information available on our website. Click the link to explore the resources that we have compiled thus far: https://www.intlstemblv.net/resources

2. We are working towards including more resource information from different countries on our website. If you are not a member yet, click the link to join us for free and stay tuned for new updates: https://www.intlstemblv.net/join-us

3. We share a variety of information related to STEM for BLV on our forum on a regular basis, including events, articles, research, and people in the field. Click the link to visit or join our forum: https://www.facebook.com/groups/4458585407596556

Co-Founder's Letter to Members

Hello dear members,

In this letter, I will tell you how I started working in science education for visually impaired students. My first work in this field started when a visually impaired high school student wanted to learn physics, but her teacher didn't know how to teach her [1]. At that time, I didn't know either; however, I didn't think it was impossible and, most importantly, I had self-confidence. We worked remotely via e-mail, sharing photos, videos and directions. I thought optics was the most difficult subject for a visually impaired person to understand, especially starting with two questions with figures asked in the university entrance exam. At the end of the training I gave her, this totally blind student answered these two questions correctly. I felt really happy and proud; what a great job! With this student who had no perception of light, we had managed to solve a national-level exam question about how light is reflected in mirrors. With years of experience, I now know that all subjects can be taught with appropriate materials and methods. This can be done without high technology; the topic of spherical mirrors can be studied using pieces of yarn, sugar cubes, a board and pins.

In those early days, before choosing the subject of my doctoral thesis I was doing a lot of reading; as I moved from a physics background into the field of education. While on the one hand studying chaos theory (which I continue to work on today), I reflected on similarities in the field of education, such as with sensitive systems, strange attractors, model formation and the butterfly effect, even considering a deeper analysis of the interface between chaos theory and education [2].

At the time, curious about Braille writing, I went to (a center for the blind?) to find out about it and realized that visually impaired people do not use a mouse with a computer. I was shocked when they told me they had "no need". How could such an important piece of a computer be unnecessary for those without sight. In the pre-touchscreen days of 2008, I felt sure "visually impaired people should be able to use a mouse" [3].

Everyone I met during my search was recommending me to a specialist at my own university. Meeting Claire ÖZEL was the beginning of my science education studies with visually impaired people. My previous work had essentially been pre-preparation. Listening to her and the examples she showed me that day, I realized that I was entering a completely different world. As I told her I was just writing a flash application for visually impaired students using a mouse, she valued my intention while showing me possible options. She sent me away with some links and documents. Each visit to her office, my file and then bag became larger. 18 months later at the court case taken by a visually impaired student against his department, I was the only person who had any

knowledge on the matter. Eventually, I did my doctoral thesis in this field. Since then, this has become my field of expertise. That first meeting was a turning point for me; I still continue to learn new things from her (now one of our volunteers).

In those early days, in order to better understand why visually impaired users didn't use a mouse, I created a webpage inviting both sighted and visually impaired participants to respond to oral directions to move a cursor. As feedback started to come, the first related to the sound. This sighted user wanted to turn the sound off and follow written instructions. The web page was designed in such a way that the audio version of the text in the picture was announced when the mouse cursor hovered over the sound packages. I had thought that the use of a mouse should be a right; I later understood that it was not an issue of rights, but one of choice and practicality. I realized years later that this system of sound packages can also be used on tactile screens. During the same study, a visually impaired activist asked why there were different pages for sighted and sight-impaired users; he wanted to be able to use the same page as everyone else. It was then that the building blocks of universal design began to fall into place in my mind.

I'm now quite clear in my mind; if a reform is to be made in education, this should be to make structures, approaches and materials compatible with universal design, where everyone is included. Visually impaired people cannot be ignored simply because they are few in number. Just as a small effect, such as the flapping of a butterfly wing, can bring about big results, the ability of a visually impaired student to learn a concept through alternative ways, verbally, tactilely or others, contributes to the learning of all sighted students. In inclusive education environments, approaches that engage more senses are among the most powerful ways to enrich the learning climate. Supporting students with visual impairments and other special needs is not a favor, it is an indispensable component for the right to education and the development of education for all.

The STEM BVL network we have established is a community of qualified and experienced people, which will develop better educational opportunities for visually impaired people specifically, and educational approaches in general. While waiting for the wider society to grasp such new notions, I offer my respect and love to those who have already understood this necessity.

Mustafa Şahin Bülbül, PhD