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Enhancing STEM Education using Wearable Biofeedback.

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Education and learning are the most critical goals in every society. For this purpose, we propose tools and technologies such as neuroengineering and wearable devices to study students' cognitive and emotional engagement to improve their learning ability [1]. Our customised wearable devices can measure bio- as well as neurofeedback from students and accordingly assist their educational behaviour and learning activities in real-time. We therefore demonstrate a setup that uses different wearable sensors to detect and record various biofeedback and neurofeedback from students and analyse the effect on their learning ability and physiological state. Our setup relies on using a combination of the following technologies:

- An eye-tracker, which was used to monitor eye movements and to analyse student attention [2].
- An EEG device, which was used for measuring brain neural activities to diagnose attention deficit hyperactivity disorder (ADHD) [3].
- Galvanic skin responses (GSR) sensors, which were used for detecting changes in electrical (ionic) sweat activity to identify Mood Disorder [4].

Moreover, we propose a framework that supports students' academic success by employing wearable technology to measure student engagement in classroom settings. Our work therefore can have a profound impact on improving the way we teach STEM subjects, especially to marginalised students [5].

References:

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