Research

Associate Professor Ts. Dr. Mohd Azrul Hisham develops ErgoSmart Desk to alleviate back pain

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PEKAN, 3 July 2024 - Back pain, particularly Lower Back Pain (LBP), is a prevalent issue among individuals who spend extended hours in office environments, seated for up to seven or eight hours daily.

Incorrect sitting posture, exacerbated by non-ergonomic desks, is a primary cause of LBP. To address this, Associate Professor Ts. Dr. Mohd Azrul Hisham Mohd Adib from the Faculty of Mechanical and Automotive Engineering Technology (FTKMA) at Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), aged 40, has developed the ErgoSmart Desk.

This innovation stems from his research titled 'Semi-Automated ErgoSmart Desk for Patients with Back Pain Problems'.

The ErgoSmart Desk features semi-automatic adjustable height capabilities designed to mitigate and prevent LBP by promoting ergonomic postures.

"This desk is engineered to provide an aesthetically pleasing design while supporting ergonomic postures essential for user comfort.

"The idea for this project arose from observing a rising trend in LBP among sedentary workers.

“Development of the ErgoSmart Desk spanned approximately three years, commencing in April 2021 and concluding in March 2024,” explained Dr. Mohd Azrul Hisham.

He said, two prototypes were produced based on feedback from office users and physiotherapists, subsequently refined for optimal usability.

"The desk incorporates an innovative semi-automatic height adjustment mechanism, reducing strain on the user's back muscles during adjustment.

"It also integrates smartphone connectivity via the TALKK app, enabling users to remotely control desk settings, monitor sitting and standing positions, and receive posture adjustment notifications."

“Additional features include drawers on both sides for electronic accessories, with the desk weighing only 3 kg, designed in a portable bag format for easy transportation,” detailed Dr. Mohd Azrul Hisham.

"The ErgoSmart Desk enhances functionality, usability, and effectiveness in promoting spinal health and ergonomic comfort within office settings," emphasized Dr. Mohd Azrul Hisham, who obtained his Doctorate from Osaka University, Japan.

He further highlighted the desk's potential to combat sedentary behavior and reduce LBP statistics nationwide by encouraging periodic changes in posture.

"The product has garnered positive feedback, particularly from professionals with sedentary occupations such as tailors, fashion designers, draftsmen, and editors.

"Future iterations will tailor enhancements to specific job requirements."

“Collaboration with industry experts, including consultation from Kuala Lumpur Physiotherapy Centre (KLPC) under Physiotherapy Consultant Narimah Daud, enriched the ErgoSmart Desk's development process," noted Dr. Mohd Azrul Hisham.

He said, the estimated purchase cost per unit of the ErgoSmart Desk is approximately RM389.90.

"Future research aims to delve deeper into long-term effects on user health, exploring ergonomic, psychological, and productivity impacts,” revealed Dr. Mohd Azrul Hisham.

He expressed aspirations for integrating advanced technologies like health sensors, Artificial Intelligence (AI), and Internet of Things (IoT) to enhance the ErgoSmart Desk's intelligence and responsiveness to user needs.

"Commercialization plans aim to scale production, making the ErgoSmart Desk affordable across various segments of society," he added.



His research has received accolades, including a silver medal at the Advanced Innovation & Engineering Exhibition (AiNEX 2021), a gold medal at the 14th Creation, Innovation, Technology & Research Exposition (CITREX 2023), and most recently, a gold medal at the Malaysia Technology Expo (MTE 2024).

Aside from the ErgoSmart Desk, Dr. Mohd Azrul Hisham and colleagues from the Human Engineering Group at FTKMA have developed other impactful products such as PhyWALK and PhyMILL for children with Cerebral Palsy, and the WRehab Device for stroke patients.

By: Safriza Binti Baharuddin, Centre for Corporate Communications

Translation by: Aminatul Nor Mohamed Said, UMPSA Career Centre (UMPSACC)

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