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UTeM Researchers Successfully Create 3D-Printed Prosthetic Leg, Lighter, More Comfortable, and Marketable

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MELAKA: A team of researchers from Universiti Teknikal Malaysia Melaka (UTeM) has achieved a breakthrough in medical innovation by developing a 3D-printed prosthetic leg that is lighter, more comfortable, and more affordable compared to conventional prosthetic legs. This innovation has the potential to significantly impact users, especially those from low-income backgrounds and individuals with health conditions such as diabetes.

According to the Lead Researcher of the 3D-Printed Prosthetic Leg, Mohammad Rafi Omar, this prosthetic leg is designed with an average weight of only one kilogram, making it significantly lighter than conventional products, which often cause discomfort due to excessive weight. Additionally, its ergonomic design allows for better ventilation with a perforated structure, effectively reducing perspiration, a common challenge for prosthetic leg users.

More Affordable and Efficient 3D Printing Technology

This innovative product utilizes **selective laser sintering (SLS)** technology in the 3D printing process, enabling faster and higher-quality production. Compared to conventional prosthetic legs, which take longer to manufacture and are costly, the 3D-printed prosthetic leg can be completed within approximately two weeks. This cost reduction provides an opportunity for more patients to own high-quality prosthetic legs without financial strain.

“We received feedback from users who needed a prosthetic leg that is lighter and more comfortable. Many experience discomfort due to excessive perspiration, which can lead to skin irritation, itching, and, in more severe cases, infections that may cause additional complications, particularly for diabetic patients,” said Mohammad Rafi.

Distribution to Recipients and Prospects for Commercialization

To date, seven units of the 3D-printed prosthetic legs have been distributed to seven selected recipients from low-income groups in Melaka. UTeM Vice-Chancellor, Prof. Datuk Dr. Massila Kamalrudin, stated that this success demonstrates UTeM’s commitment to producing innovations that benefit society, aligning with the university’s efforts to support those in need.

“We believe this product has great potential to be commercialized on a wider scale, both locally and internationally. With support from industry players and investors, we are confident that more individuals will benefit from the 3D-printed prosthetic leg,” Massila explained.

The handover ceremony of the 3D-printed prosthetic legs to recipients was held in conjunction with the **Public University Community Empowerment Program (Komuniti@UniMADANI)** at Samsung IoT, UTeM Technology Campus, recently. The program was coordinated by the **RICE UTeM-Melaka Collaboration Management Center**, sponsored by the **Ministry of Finance**, and officiated by **State Executive Council Member for Science, Technology, Innovation, and Digital Communication, Datuk Fairul Nizam Roslan**. Also present at the event was **Deputy Executive Council Member, Datuk Mohd Noor Helmy Abdul Halem**.

Future Potential and Long-Term Plans

Given the positive reception from initial recipients, the UTeM research team is now working to further develop this technology by designing more customized prosthetics to meet individual needs. Further research is also being conducted to enhance the durability and user-friendliness of the prosthetic leg.

“In addition to improving comfort and durability, we are also exploring the use of eco-friendly materials to make this product more sustainable. In the long run, we hope this initiative will not only assist the target groups but also contribute to the development of green technology,” added Mohammad Rafi.

With this achievement, UTeM has once again demonstrated its capability in producing innovations that bring significant benefits to society. This initiative is expected to bring new hope to prosthetic leg users, enabling them to lead more comfortable and confident lives.