

# Chocolate research shapes the future of gift shopping

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Credit: David Martin, EPSRC

Manufacturing and retail could get a boost from a newly-developed 3D chocolate printer.

In the long term the technology could be used by customers to design many different [products](#) themselves – tailor-made to their needs and preferences.

The project is being led by the University of Exeter in collaboration with the Brunel University and software developer Delcam. It is funded as part of the Research Council UK Cross-Research Council Digital Economy Program and is managed by the Engineering and Physical Sciences Research Council (EPSRC) on behalf of ESRC, AHRC and MRC.

3D printing is a technology where a three-dimensional object is created by building up successive layers of material. The technology is already used in industry to produce plastic and metal products, but this is the first time the principles have been applied to chocolate.

The research has presented many challenges. Chocolate is not an easy material to work with because it requires accurate heating and cooling cycles. These variables then have to be integrated with the correct flow rates for the 3D printing process. Researchers overcame these difficulties with the development of new temperature and heating control systems.

Research leader Dr. Liang Hao of the University of Exeter's College of Engineering, Mathematics and Physical Sciences said: "What makes this technology special is that users will be able to design and make their own products. In the long term it could be developed to help consumers custom-design many products from different materials but we've started with chocolate as it is readily available, low cost and non-hazardous. There is also no wastage as any unused or spoiled material can be eaten, of course! From reproducing the shape of a child's favourite toy to a friend's face, the possibilities are endless and only limited by our creativity."

A consumer-friendly interface to design the chocolate objects is also in development. Researchers hope that an online retail business will host a website for users to upload their [chocolate](#) designs for 3D printing and delivery.

Designs need not start from scratch, the web-based utility will also allow users to see designs created by others to modify for their own use.

Dr. Hao added: "In future this kind of technology will allow people to produce and design many other products such as jewellery or household

goods. Eventually we may see many mass produced products replaced by unique designs created by the customer.”

EPSRC Chief Executive Professor Dave Delpy said: “This is an imaginative application of two developing technologies and a good example of how creative research can be applied to create new manufacturing and retail ideas.

“By combining developments in engineering with the commercial potential of the digital economy we can see a glimpse into the future of new markets – creating new jobs and, in this case, sweet business opportunities.”

Provided by University of Exeter

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