Jisc Edtech Challenge

a virtual learning environment without a screen

Boxi: a personal learning companion

Idea submitted by **Leanne Fitton** from Manchester Metropolitan University

Description

Video link: https://youtu.be/7auzkMiAZ6A
The Boxi portable learning assistant is a device that can be provided to students, which they will be able to carry around with them so that they can study at any location and time. The device brings together various technologies and hardware within it and I believe it is an interesting concept, that takes these emerging technologies and places them into a device dedicated to helping students learn.

The technical details of the device are outlined in the video, but would include a camera, projector, microphone and speaker (with headphone jack). The device will be able to connect to the internet through wi-fi or mobile data and the location of the device will be able to be detected through either bluetooth (and beacons) or GPS.

The device would have an in built chat-bot, that would be the interface between the student and the University learning systems. Students would be able to set the device up wherever they want, with the projector displaying any visual material onto a material which works for the student. This may be traditional paper, a reusable notebook or a mini-whiteboard. The students would be able to write on the material and this would be picked up by the scanner, allowing augmented reality to provide instant feedback in form of a work through of the correct answer or alternative.

The specific areas where I believe the device would be able to have a demonstrable impact are outlined below:

Problem 1: Relying on mobile devices means that students have access to different technologies - different operating systems, access to different apps, different functionality in terms of apps, different accessories. This can make it difficult to ensure that all students can access all resources.

- The Boxi would allow all students to have access to the same core technologies, reducing some of the access issues that students may face with technology.

Problem 2: Students have busy lives with several commitments (caring, work etc) and flexibility (location and time) can help alleviate some of the pressures that they face.

- Boxi is portable so learning can take place at any location of the students choosing.

- Students will be able to indicate the time that they have available and Boxi will be able to advise them of a suitable activity.
- The option to use headphones with Boxi will allow students to learn during commuting.

Problem 3: It can be difficult for students to find the information that they need in the current style of VLE, where they are often faced with a long list of resources, from which they have to identify the correct one.

- Using voice recognition and chat bot technology, the device would allow students to ask questions such as "what do I need to do before my lecture tomorrow?" "where I am up to with my biology revision" and "have I improved my score since the last quiz?"

Problem 4: Using a VLE is an activity in itself, so there is little scope for providing information to students at specific locations.

- As the device has location detection software, it will be able to trigger learning activities based on the location of the student. So for example, as they are passing the library, the device would be triggered and the student would be reminded of the book that they need to lend.
- As the device is designed to be portable, notifications can be sent at a timely opportunity. For example: "you wanted someone to explain this concept to you, your tutor is having their office hours after you finish your lecture this afternoon, why don't you go along"

Problem 5: VLEs are designed to meet the needs of the course, rather than the needs of the individual students, making if difficult for all materials to be accessible for all students.

- As students can interact with the device either by using their voice or by using the scanner, students with specific learning needs can work in a way that suits them. For example, a student with a visual impairment may rely on the voice interface, whereas a student who has hearing difficulties may rely more on the scanning function.
- As the chat-bot would allow a personalised conversation to take place, this would likely provide a benefit for students who have difficulties with organisation.
- As the material that the resources can be projected on can be chosen by the student, this would mean that needs such as yellow background or non-glare material could be addressed, with the need to buy expensive equipment.

Problem 6: Other than for simple assessments, such as multiple choice questions, students often have to wait for detailed feedback on their work.

- Using the scanner function of the camera and OCR technology, students written work can be inputted into the system, allowing for comparison of the correct answer, allowing for immediate feedback.
- As AI develops, it is likely that this function will evolve into providing feedback on essay style, report structure and more!
- The conversational nature of the chatbot will allow students to know whether they are on the right track and receive an update on their progress on a regular basis.

As a thought experiment, thinking about how the emerging technologies could be pulled together and change the way in which we think of (virtual) learning environments has been extremely eye-opening. Boxi is a stark contrast to the virtual learning environments currently being used and although it is probably unlikely that it will be implemented in its current design state, I am confident that aspects of Boxi will be commonplace in the future higher education sector.