SMARTWATCHES AS A LEARNING TOOL: A SURVEY OF STUDENT ATTITUDES

Neil Davie and Tobias Hilber
South Westphalia University of Applied Sciences
Lindenstrasse 53, 59872 Meschede, Germany

ABSTRACT

Both teachers and students of language learning are keen to make use of new technologies to enhance their learning. At the latest, the launch of the Apple Watch has made the general public aware of the smartwatch and the possibilities, at least according to the marketing hype, that these wearable computers offer. The sales of smartwatches are predicted to increase rapidly in the next years and many of the adopters of this technology will undoubtedly be students or teachers. Based on a non-representative sample of higher education students this paper explores student attitudes towards the use of smartwatches as learning tools. It also offers a new definition of a smartwatch and provides an overview of the types of educational smartwatch apps already available. The analysis of the questionnaires show that both smartwatch owners and non-owners are not overly convinced that smartwatches can be used for educational purposes. As the questionnaire was purely quantitative it is however impossible to discuss how the participants have so far experienced smartwatches, if at all. A further study using qualitative methods is therefore recommended to provide further insight into how and why students are using smartwatches, if at all, to aid with their studies. The predicted growth in smartwatch ownership means it would be prudent to examine the possibilities offered by these devices whilst their use can still be shaped by educators.

KEYWORDS

smartwatch, mlearning, usefulness, student, attitudes, TAM.

1. INTRODUCTION

Many commentators have questioned whether there is actually any need for smartwatches. Apparently, however, a horde of ingenious (some might say malevolent) students have seized the opportunity to use this new technology to cheat in exams (Tuoi Tre, 2013). That is, at least, the fear that many universities around the world saw with the launch of the Apple Watch and promptly banned smartwatches, or indeed all watches, from being worn during examinations (Charara, 2015). This fear would seem to suggest that smartwatches can therefore somehow be used to store and discretely retrieve information or search for it online – functionalities which form an important part of the usefulness of smartphones in mobile learning. It would therefore seem wise to consider how smartwatches can be used in a learning environment, by both students and teaching staff. Doing this now whilst the ownership of smartwatches amongst students is still relatively low also allows educators to influence and shape the use of these devices accordingly. A study of 124 undergraduate and graduate students at South Westphalia University of Applied Sciences found that less than 10% already owned a smartwatch. A previous study at the same institute showed that 100% of the sample group owned a smartphone. Therefore, according to Rogers' technology adaption lifecycle (Rogers, 2003) the smartwatch ownership is still at the early adopter stage when less than 16% of the total population own a specific type of device (see figure 1).

ISBN: 978-989-8533-49-4 © 2016

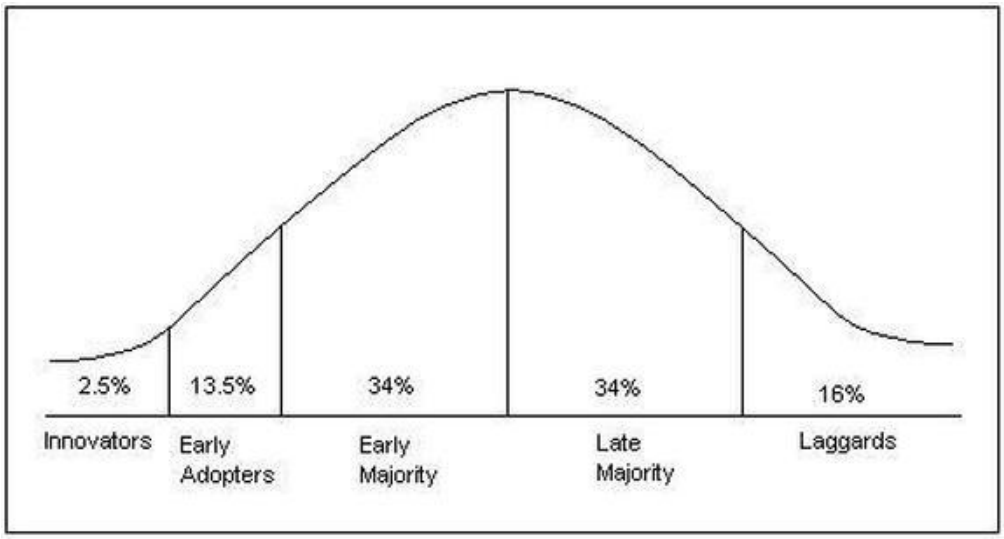

Figure 1.Categories of Innovativeness according to Rogers

There are many definitions of what a smartwatch actually is. In 2014 Oxford Dictionaries added the term to their online dictionary and defined it as:

"A mobile device with a touchscreen display, designed to be worn on the wrist."

This definition however excludes the models from Peeble which do not have a touchscreen but have already sold over 1 million units and are described by the manufacturer themselves and reviewers as smartwatches.

According to industry experts the Smartwatch Group:

"A smartwatch is a wrist-worn device with wireless internet connection".

In particular they claim that a smartwatch is defined by the fact that it is:
1. worn on the wrist
2. able to indicate time
3. able to wirelessly connect to the internet

The first two points can be considered self-evident for smartwatches and normal watches and are therefore unimportant. According to the Smartwatch Group it is therefore point three which characterizes the defining difference between a smartwatch and a regular watch. Although only a few of the presently available devices include wifi or a SIM card to connect to the internet directly, the majority of devices can do so through piggybacking the smartphones internet connection. A more precise definition would therefore seem to be that a smartwatch is a wrist-worn device which can act as an extension to a smartphone and run its own applications. The emphasis on apps is a reflection on the distinction generally made between a traditional "dumbphone" and a smartphone.

2. SMARTWATCHES

2.1 Smartwatch Affordances and Limitations

The affordances offered by smartwatch technology must be considered before an analysis of the usefulness of these devices in education can be made. As a companion device or extension to a smartphone, a smartwatch offers the same or even enhances many of the affordances offered by a smartphone such as ubiquity.

However, due to the size or design of the devices they may however have some limitations which are not so readily present in smartphones.

Table 1.Affordances and limitations of smartwatches

Affordances	Limitations
Ubiquitous	Small screen
Always on	Limited input methods
Discrete	Cost
Personal	Durability
	Compatibility – various operating systems
	Low market penetration to date

3. SMARTWATCH APPLICATIONS FOR LEARNERS AND TEACHERS

Despite the early stages of smartwatch ownership there are already several applications available which are aimed explicitly at learners or can be used for learning purposes. One of the first areas which developers have address is language learning – unsurprising as this is one of the subject areas where mobile learning (here more specifically known as mobile-assisted language learning or MALL) is most advanced.

One of the first Android Wear apps to be released was for Duolingo, a smartphone-based language learning app offering courses in several languages including German, Spanish and Russian. Rather than mirror the entire smartphone app on the smaller screen of a smartwatch, this app focuses on providing a flashcard-style system for learning and testing vocabulary.

Although the Peeble smartwatches were originally only available with a monochrome screen and with lower technical specifications than other systems, developers here have also found creative ways to implement mobile learning. The developer has programmed several watchfaces which show vocabulary from a defined-set at a predetermined interval. This means that along with showing the date and time, the screen also displays a word from your chosen language collection. By pressing a button on the watch you can then see a definition of the word or a translation in your native language.

The Babel app was the first language learning system to launch an app for the Apple Watch. The app promises to offer contextual vocabulary learning by recognizing where the user currently is and, for example, offering typical vocabulary for ordering a drink when the user is sitting in a café.

For teachers smartwatches offer several possibilities to assist in the classroom. Timer apps for monitoring speeches or presentations are available for all platforms as well as the possibility to remotely control presentations.

4. RESEARCH METHODOLOGY

To measure smartwatch ownership and to better understand student attitudes to smartwatches and their usefulness, in April 2015 a questionnaire was given to a non-representative convenience sample of 124 undergraduate and postgraduate students at the South Westphalia University of Applied Sciences in Meschede, Germany. Davis's Technology Acceptance Model (TAM) is a commonly used method of evaluating the potential success of a new technology. The perception of the value of a particular technology is evaluated on the basis of "Perceived usefulness" (PU) and "Perceived ease of use" (PEU). Davis describes Perceived usefulness as

"The degree to which a person believes that using a particular system would enhance his or her performance".

Perceived ease of use was described by the author as

"The degree to which a person believes that using a particular system would be free from effort."

Following the survey a focus group with five students was conducted. All five students owned smartphones and four of them had previously used their phones for learning. None of them owned a smartwatch. The students were shown a video of some smartwatch learning apps and then allowed to use a pebble and an Android wear smartwatch for thirty minutes.

4.1 Findings

At 23 years old the average age of the smartwatch owners was one year younger than that of the non-owners but given the small size of the sample this is not considered to be relevant. The youngest students in both groups were 19 years old whereas the oldest members of each group varied.

Table 2. Participant age

Group	N	Min	Max	Mean	Mode
Smartwatch owners	9	19	32	23.7	22
Non-owners	115	19	36	24,7	25

Firstly, the attitude to the usefulness of a smartwatch as an organizational tool was assessed (see figure 2).

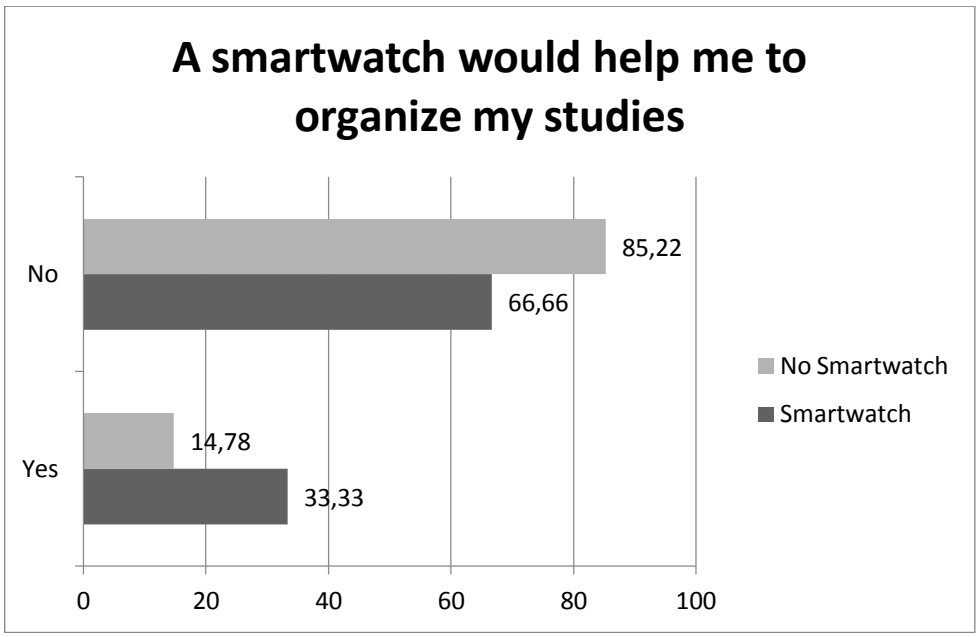

Figure 2. A smartwatch would help me to organize my studies

When asked whether a smartwatch could help them to learn, only 11% of the smartwatch owners agreed with the statement whereas slightly more of the non-owners (over 14%) believed that a smartwatch could serve as a learning tool (see figure 3).

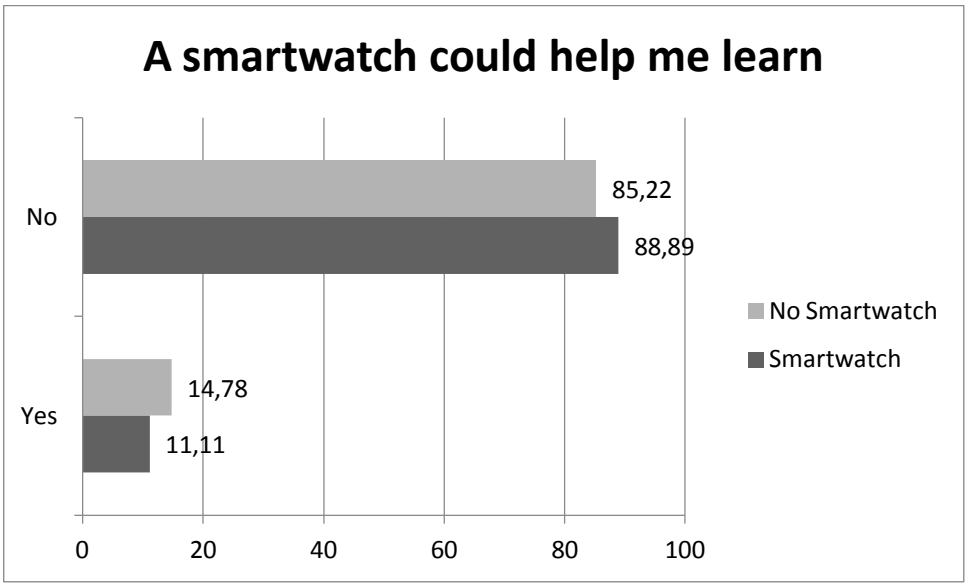

Figure 3. A smartwatch could help me learn

Lastly the students where asked whether a smartwatch could help them to revise or test material they have already learnt (see figure 4). Again only 11% of the smartwatch owners agreed with this statement in comparison to over 19% of non-smartwatch owners.

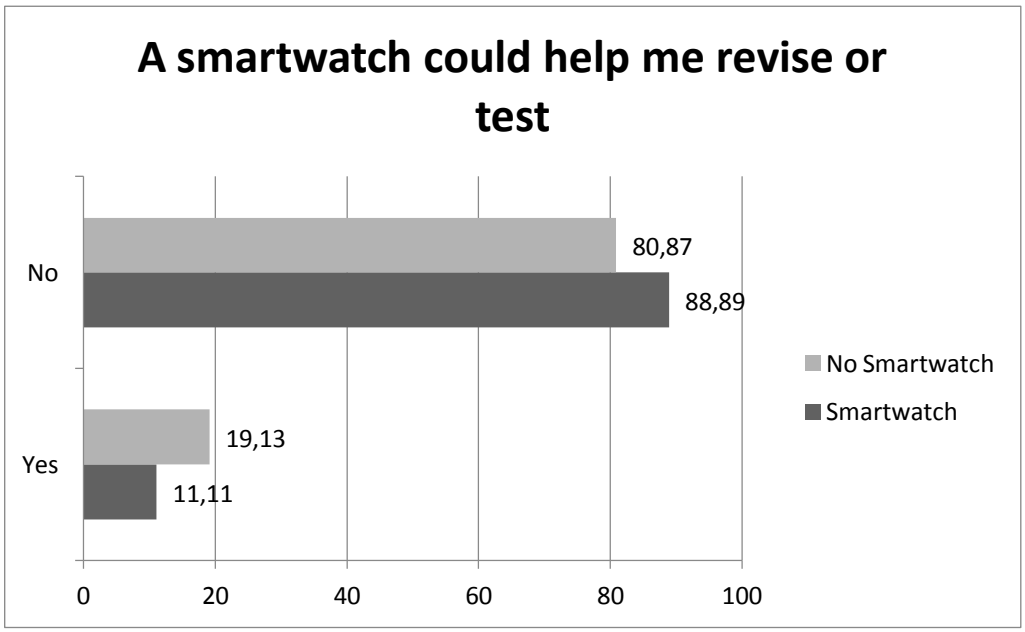

Figure 4. A smartwatch could help me revise or test

The focus group participants praised the ubiquity of the smartwatch as a learning tool but criticized it as too small for serious learning. It was thought acceptable for providing translations or simple flashcard functions but not appropriate for more complicated tasks. The battery life of the watches was also viewed with scepticism, however it was felt that it could be a useful addition to being better organized.

5. CONCLUSION

The small size of the group of smartwatch owners, especially in comparison to the size of the group of non-smartwatch owners, means that the results cannot be considered significant. The survey also did not explore how long the smartwatch owners had been using their watches and what they had been using them for. The results may also be influenced by a lack of knowledge amongst both groups regarding the organizational and learning opportunities offered by such devices. Alternately, it may well be that the smartwatch owners have attempted to use their watches for learning purposes but have found them to be wanting. The focus group showed that the students were not convinced of the usefulness of smartwatches as a learning device. A further qualitative study would gain more insights into whether and how the smartwatch owners have used their watches for learning purposes. After the student survey was conducted the staff awareness of the possibility to cheat in exams using a smartwatch rose leading to the exam regulations being updated and smartwatches being banned from all exams. This announcement may have raised awareness of the educational possibilities offered by smartwatches or may actually have discouraged students from buying one. Further qualitative research could explore this aspect in more detail.

ACKNOWLEDGEMENT

We would like to thank all of the 124 students who took part despite the pressure of forthcoming exams.

REFERENCES

Books

Rogers, E.M. (2003). Diffusion of Innovations (5e). Free Press, New York.

Website

Charara, S. (2015). Apple Watch success means universities are banning all watches in exams. Retrieved November 22, 2015, from http://www.wareable.com/apple-watch/apple-watch-launch-means-universities-will-ban-all-watches-in-exams-804

Esakia, A. et al. (Undated). Smartwatches in CS Education. Retrieved July 27, 2015, from http://research.cs.vt.edu/ns/smartwatch

Granata, K. (2014) Tech in the classroom: Peeble smartwatch. Retrieved June 9, 2015, from http://www.educationworld.com/a_tech/tech-in-the-classroom/pebble-smartwatch.shtml

JBDON. (Undated). Roger's Diffusion Of Innovation Theory. Retrieved November 22, 2015, from http://www.jbdon.com/rogers-diffusion-of-innovation-theory.html

Odegard, A. (2013). Smartwatches can potentially be very useful in education. Retrieved June 9, 2015, from http://www.pocketables.com/2013/04/smartwatches-can-potentially-be-very-useful-in-education.html

Pogue, D. (2014). The Case against Smartwatches. Retrieved October 9, 2015, from http://www.scientificamerican.com/article/the-case-against-smartwatches

Smartwatch Group. (Undated). Smartwatch applications: Education. Retrieved June 9, 2015, from http://www.smartwatchgroup.com/education

Tuoi Tre. (2013). Student disciplined for cheating on exam with smartwatch. Retrieved June 8, 2015, from http://tuoitrenews.vn/education/11019/student-disciplined-for-cheating-on-exam-with-smartwatch

Vander Ark, T. (2015). Push learning: How smart notifications will change education. Retrieved June 9, 2015, from http://gettingsmart.com/2015/05/push-learning-how-smart-notifications-will-change-education