

Book Review:

Wearable Technology and Mobile Innovations for Next-Generation Education

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ABSTRACT

In recent years, wearable and mobile technologies have been applied in different domains such as medical, personal safety, sports, and lifestyle computing. Wearable technologies may help users bring their experiences, engagements, and interactions from one context to another. These kinds of devices can be worn by people and they make it possible to enhance our lives. It is believed that wearable technology may also have a great impact on education because it could be adopted to foster educational experiences, inspire intrinsic motivation, and bring one close to youth culture and usage behavior. However, there are few publications introducing wearable and mobile technologies within the framework of teaching, training, and learning.

KEYWORDS

Mobile Innovations, Next-Generation Education, Wearable Technology

In recent years, wearable and mobile technologies have been applied in different domains such as medical, personal safety, sports, and lifestyle computing (Cheng & Mitomo, 2017). Wearable technologies may help users bring their experiences, engagements, and interactions from one context to another (Ching, Stewart, Hagood & Rashedi, 2016). These kinds of devices can be worn by people and they make it possible to enhance our lives. It is believed that wearable technology may also have a great impact on education because it could be adopted to foster educational experiences, inspire intrinsic motivation, and bring one close to youth culture and usage behavior (Larabi Marie-Sainte et al, 2016). However, there are few publications introducing wearable and mobile technologies within the framework of teaching, training, and learning.

To catch up with this trend, *Wearable Technology and Mobile Innovations for Next-Generation Education* is a compilation of coherent and thorough chapters that lead readers to know the concept of wearable technology, its functions and adoptions in different domains, its helpfulness for those with disabilities, and to learn how to use these devices appropriately for increased utility to facilitate effective learning applications.

The book is divided into four sections; in addition to the foreword and preface, there are 15 chapters. The first four chapters are grouped into Section One “Mobile and Wearable Technology Introduction”. Throughout this section, it is possible to see a thoughtful arrangement of each chapter. For instance, Chapter 1 begins with a brief history of wearable technology and covers the scope of this field (medical science, entertainment, architecture, and business, as well as education), which

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aims to guide readers who are familiar with it so that they can get up to speed quickly. In another instance, Chapter 2 first points out that the educational system of the past was always considered a listening place; nowadays, teaching will be more dynamic and active if instructors could use innovation technology to assist learning process. Therefore, the relationship among digital natives, technologies and education are important. The authors further introduce an innovative tool “wearable technology” that drives us to consider the implementation of technological possibilities in the education domain. As mentioned previously, Chapter 3 illustrates that there is still relatively little research that has examined the issue of using wearable technology in education. Therefore, the author investigates the potential applications that wearable and mobile technologies could have in K-12 educational environment, and also provides strategy and research-validated approaches for procuring and supporting wearable technologies. After exploring the use of wearable technology in education field, Chapter 4 turns the focus to introduce the use of wearable technology related to health and fitness domain. The history of each wearable as well as their basic functions is presented. Health and fitness wearables occupy a prominent position in the marketplace; the authors believe that these technologies have impacted both the education field and health-minded consumers. This Section helps readers to better grasp the trend of wearable technology.

Section Two, “*Mobile and Wearable Technology Device Extensions*” consists of four chapters. As the trend of embedding multiple sensors and technologies into new devices advances, the development of wearable technologies becomes more and more diverse. In this section, each chapter presents the extension of wearable technology, such as digital badges, wearable cameras, wearable technologies in academic information search, and educational multimedia. Before reading this section, the fundamentals of digital badges were obscure to us, so we found the authors’ elaboration of the digital badge system enlightening; this encompasses wearable technology, its assessment, and a framework supporting a wider spread, collection and sharing of badges. After that, wearable cameras are introduced; these devices have many functions which already been applied in different domains such as health, sports, spying, police, military, education, overcoming disabilities, and lifelogging. Next, the use of wearable devices (Google glasses and a smart watch) in academia is discussed. The advantage of using wearable devices is that they could help library users to download directions, maps, and secondary APPs to support the information search process. However, there are some concerns with using wearable devices in academia, such as test security and cheating, as they include cameras and communication tools, which allows students to search information, communicate with others, and share information via these devices.

The four chapters (Chapters 9 to 12) grouped into Section Three “*Mobile and Wearable Technology Applications*”, bring the readers a full spectrum of programs and applications in response to the use of innovative technology tools in the education field. Wearable devices can be regarded as an assistive technology to improve our lives, including those of people with disabilities (PWD). Chapter 9 specifically elaborates how wearable devices assist PWD, such as Wearable Power Assist Locomotor (WPAL), Google Glasses, and the Tongue Drive System (TDS). Besides, the authors also introduce some devices for people who are deaf, deaf-blind or hard of hearing, including gesture vocalizer, talk enabler, Jafari’s motion and muscle tracking approach to American Sign Language (ASL) translation, finger-braille, glove prototype for deaf-blind, ESight eyewear, as well as OrCam. These applications could satisfy the needs of PWD for meeting on-the-job demands. In addition to making use of wearable technology to assist PWD, wearable and mobile technology is also accommodated in distance higher education programs. The use of 3C products such as laptops, tablets or smart phones with recorded teacher-created flipped classroom videos and mobile online webinars face-to-face (F2F), not only provides the function of online F2F interactions, recording flipped classrooms and parallel chat communications, but also facilitates students’ active learning and helps them to collaborate in a more digitized education environment. Additionally, Google AdSense can also be regarded as a mobile technology and applied in education, especially in the area of tourism education. Google AdSense is an innovative technology so there is not much literature about it yet. The authors review the history

and definition of Google AdSense; it can be viewed as a click and pay system, wherein, if website visitors click one of the AdSense ads, the website owner is credited for the referral. Users have to sign up as a member of AdSense, after that the website allows them to design, prepare and to view the appearance of their proposed advertisement. This may attract students and the youth population to mainstream economic activities, and develop understanding of their personal preferences. The last chapter of this section explains the use of mobile devices with Augmented Reality for teacher training via a case study. The author mentions that the ScavengAR Hunt offers pre-service teachers a chance to know what can they do and how can they prepare, by utilizing these tools in course design for classroom activities.

Section Four “*Mobile and Wearable Technology in Applied Sciences*”, comprises chapters 13 to 15, which aims to explore how wearable devices are used in the science domain. Wearable technology devices are suitable for earth science applications because of their convenience and how they humanize study of this domain. Wearable technology in earth science could utilize the Global Positioning System (GPS), thus improving situational safety awareness, gathering and sharing data among geographically dispersed team members. Furthermore, wearable technology can also be adopted in Engineering education. Chapter 14 introduces the WearTec instructional program, which mainly focuses on: 1. Electric circuits and engineering design, 2. Understanding microcontrollers, 3. Computer programming, and 4. Using engineering design to complete a T-shirt project. Findings indicate that students’ self-efficacy results increase student confidence regarding circuitry and programming skills. The final chapter of the book demonstrates the experience of using smart phone clickers to track and analyze students’ content acquisition in basic sciences and biotechnology domain, which bring the benefit of stimulating them to pursue higher education courses in these areas.

One weakness in terms of the book’s structure is the arrangement of sections, especially in each chapter. It is suggested that the relevant areas of wearable technology applications could be categorized and presented in different sections. Another weakness of the book is that the book introduces many different kinds of wearable technologies (see Chapters 4, 6 & 9). As a reader, it is hard to remember every wearable technology. Therefore, the authors could have presented the core tools throughout the book to deepen readers’ comprehension and impression of key ones.

After reading this book, we find a valuable contribution is the authors’ in-depth discussion of how wearable and mobile technology devices have been used in different domains as well as their functions. The authors systematically arrange each of the components of this discussion and describe the application of these devices. In our opinion, the authors provide clear examples via specific perspectives and successfully transmit their points to readers, who may include youth, teachers, academics, researchers, and professionals.

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