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NEW PERSPECTIVES OVER THE USE OF SMARTBANDS IN UNIVERSITY-BASED HEALTH EDUCATION PROGRAMS

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Abstract

The aim of our case study is to analyze the perceived impact of smartbands on adopting an active and healthy lifestyle by students at the level of university education. Integrating recent contributions from education sciences, knowledge management and applied health informatics, the paper highlights the premises of an institutional educational program that aims to improve students' health (with a special focus on weight loss). Starting from the arguments for using smarbands in health education programs and the current research being made in this field, the authors propose several directions of study and solutions that could be integrated at university level in order to improve students' health.

Keywords: Smartbands, smartphone, health education programs, case study, weight loss

JEL Classification: I12, I23, O33

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1 INTRODUCTION

The new generation of wearable technology seems to be very promising and with great potential especially in the field of gaming industry and health services. A smartband, also known as activity tracker or fitness tracker is usually a wristband used for tracking and monitoring various fitness parameters such as: heartbeat, quality of sleep, distance. Closely integrated with dedicated mobile software applications and wirelessly connected to the mobile phones. Some smartbands have even more advanced medical sensors and are used to support medical interventions and tracking for: diabetes, sleep disorders, cardiovascular diseases, obesity, asthma, epilepsy, anxiety and Alzheimer's disease.

Based on an ICT-based healthcare practice called eHealth and in the framework of Quantified Self movement, smartbands could be also used in physical education programs. However, the pedagogical integration of such devices is still lacking and needs to be carefully analyzed first by researchers and experts. The importance of pedagogy in implementing technological innovations, such as smartbands or e-learning applications, especially in the context of mobile learning, is confirmed by many studies in the field of education sciences (Zahrani & Laxman, 2015). According to Banyard and his collaborators: "Technology is not enough to promote self-regulation and improve performance. A culture change is necessary to bring this about" (Banyard, Underwood & Twinner, 2006). Additionally, many questions are raised regarding the privacy of biodata collected from users, especially in the case of Internet of Things paradigm shift and mass utilization of wearable devices.

2 ARGUMENTS FOR USING SMARTBANDS IN HEALTH EDUCATION PROGRAMS

First, the main argument of using smartbands in health education is related to the high prevalence of obesity worldwide and particularly in Romania. According to World Health Organization (WHO, 2015): in 2014, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 600 million were obese; overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2014; in 2014, 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight; the worldwide prevalence of obesity more than doubled between 1980 and 2014; in 2013, 42 million children under the age of 5 were overweight or obese (WHO, 2015).

Second, the prevalence of cardiovascular diseases remains high worldwide, especially very high in Romania. This fact is partially explained by a similar incidence of

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risk factors and a common style of life. The Romanian population has a similar diet, rich in saturated fats, red meat, white flour, salt and sugar, leading to a high incidence of overweight (52% for men over 20 years old in Romania and 44% for women over 20 years old in Romania), the incidence of smoking is increased (38% in Romania in men and 21% in women) and alcohol consumption is high. Any educational intervention intended to reduce cardiovascular morbidity and mortality in Romania should address the reduction of these risk factors and attempt to change the lifestyle of these people (Bunescu et al, 2008).

Third, many experts think there is considerable evidence to assert that a postmodern community is likely to be virtual and mobile. Insofar geographical distance and access to technology is concerned, the new technologies for information and communication (NTIC) can bring people together and build cultural bridges over nations (Moynihan, Paakkari, Välimaa, Jourdan, & Mannix-McNamara, 2015; O'Brien, Troutman-Jordan, Hathaway, Armstrong, & Moore, 2015; Oberer & Erkollar, 2014). Many students and teachers are increasingly more communicating by using smart watches, smartphones, tablets and laptops creating the premises for a radically new culture of education A category of devices that is increasingly are wearables and particularly, smartbands.

Fourth, several studies highlighted the importance of using smartphones in various health education programs, particularly weight loss: a) in a 12-week randomized controlled trial, adults (25 ≤ BMI ≤ 35 kg/m2) were randomized to SmartLoss (n = 20) or an attention-matched Health Education control group (n = 20). SmartLoss participants were prescribed a 1,200 to 1,400 kcal/d diet and were provided with a smartphone, body weight scale, and accelerometer that wirelessly transmitted body weight and step data to a website; according to the authors: "SmartLoss efficaciously promote clinically meaningful weight loss compared with an attention-matched control group. Smartphone-based interventions might prove useful in intervention dissemination" (Martin et al, 2015); b) in another 2-arm, 12-month study, seventy adults (body mass index >25 and ≤40 (calculated as weight in kilograms divided by height in meters squared) were randomly assigned either to standard-of-care group treatment alone (standard group) or to the standard and connective mobile technology system (+mobile group). The experimental group was provided personal digital assistants to self-monitor diet and physical activity; they also received biweekly coaching calls for 6 months. Weight was measured at baseline and at 3-, 6-, 9-, and 12-month follow-up. The conclusion of the authors was that "The addition of a personal digital assistant and telephone coaching can enhance short-term weight loss in combination with an existing system of care. Mobile connective technology holds promise as a scalable mechanism for

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augmenting the effect of physician-directed weight loss treatment" (Spring, B et al, 2013).

Taking into account other studies from this field we agree together with Pellegrini, Pfammatter, Conley and Spring that "Current evidence is promising and continues to emerge on the potential of smartphone use within weight loss programs; yet research is unable to keep up with the rapidly improving smartphone technology. Future studies are needed to refine the conceptual model's utility in the use of technology for weight loss, determine the effectiveness of intervention components utilizing smartphone technology, and identify novel and faster ways to evaluate the ever-changing technology" (Pellegrini, Pfammatter, Conley and Spring, 2015). The wearables, particularly smart watches and smartbands can be an important tool in addressing both the weight loss and cardiovascular diseases issues (Bunescu, Stoffers, van den Akker, & Jan Dinant, 2008; Ferrari & Mamei, 2013; Gilson et al., 2014; Granado-Font et al., 2015; L Hebden et al., 2014; Lana Hebden et al., 2013; Knipper, Baumann, Hofstetter, Korte, & Krawinkel, 2015; Laing et al., 2014; Lee, Park, Jeong, & Park, 2015; Linde et al., 2015; Martin et al., 2015). Some of this devices track steps, distance and estimated calories burned as well as providing a timeline of how long you are active each day. The information breaks your day activity into walks, runs and activities. According to several experts "On the other hand, smartwatches have two strong advantages over other devices: their mount location, and (probably more important) the continual connection to the skin. Similar to augmented reality glasses, their interactions do not always require both hands. In particular, users do not need to hold the device, which is required by smartphones and one hand is completely occupied. Nevertheless, users need to change wrist position and, if a touch or voice input is needed, use the other hand for the interaction" (Rawassizadeh, Price & Petre, 2015).

3 POSSIBLE DIRECTIONS OF STUDY FOR USING SMARTBANDS IN HEALTH EDUCATION PROGRAMS

First, the integration of smartbands with the social networks and virtual learning communities could be very useful for boosting motivation, getting support and information regarding the best practices for weight-loss. Second, many pedagogical methods do not make use of the newest approached in ICT available to the digital natives, particularly wearable technologies; it would be very useful to integrate computer-based instruction and evaluation with smartbands or developing new physical education exercises with the help of wearable technologies (measuring the speed, calorie consumption, distance and so on). Third, the initial education curriculum should be adapted to support the use of wearable technologies, in the context of Quantified Self

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approach; the results, viewed as a form of self-reflection over one's personal activity could be useful in the context of self-regulated learning activities, mediated by the used of ICT-enabled methods. Fourth, smartbands could be useful in the case of special needs students, offering the possibility of monitoring the health and observe in time any kind of signs that would require medical care or hospitalization. As more complex technologies arise, such as smartwatches (e.g. Apple Watch), more and better perspectives appear for educators, especially at the level of higher education.

In conclusion, students' health education is an area that is was not studied enough at the level of university. More studies are needed evaluate what are the most important parameters that influence how students adopt a healthy lifestyle. Some of the instruments that can help motivate students could be smartbands, devices that are increasingly more used, usually paired with smartphones. Evidence from other studies also highlighted the fact that technology alone can't have a meaningful and long-lasting result (Bunăiașu C.M., 2013; C.M., Vlăduțescu, Ș. & Strungă, A.C., 2014, Zahrani & Laxman, 2015). Health education programs, developed under the guidance of pedagogy experts, possibly in the framework of European projects (Bunăiașu, 2011), using complementary and alternative methods (Stoian, 2015) could be included in the academic curriculum with aims such as losing weight and reducing the prevalence of cardiovascular diseases.

4 References

Al Zahrani, H., & Kumar, L. (2015). A Critical Meta-Analysis of Mobile Learning Research in Higher Education. *Journal of Technology Studies*, *41*(2), 74–89.

Banyard, P., Underwood, J., & Twiner, A. (2006). Do enhanced communication technologies inhibit or facilitate self-regulated learning? *European Journal of Education*, *41*(3–4), 473–489. https://doi.org/10.1111/j.1465-3435.2006.00277.x

Bunăiașu, C. M. (2011). *Proiectarea și managementul curriculumului la nivelul organizației școlare*. București: Editura Universitară.

Bunăiașu, C.M., Vlăduțescu, Ș. & Strungă, A.C. (2014). Managerial competences in the field of university curriculum for virtual learning communities. *Revista Românească pentru Educație Multidimensională/Romanian Journal of Multidimensional Education*, 6, 2, 17-25.

Bunăiașu, C.M (2013). Strategic directions regarding trainers' instruction in the field of European curriculum's planning and implementation. *Procedia Social and Behavioral sciences*, 116, 1121-1126.

BDD-A25750 © 2016 Sitech Publishing House
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Bunescu, D. M., Stoffers, H. E. J. H., van den Akker, M., & Jan Dinant, G. (2008). Coronary heart disease and cardiovascular risk factors among people aged 25-65 years, as seen in Romanian primary healthcare. *The European Journal of General Practice*, *14*(2), 56–64. http://doi.org/10.1080/13814780802343141

Ferrari, L., & Mamei, M. (2013). Identifying and understanding urban sport areas using Nokia Sports Tracker. *Pervasive and Mobile Computing*, *9*(5), 616–628. http://doi.org/10.1016/j.pmcj.2012.10.006

Gilson, N., Pavey, T., Gomersall, S., Vandelanotte, C., Duncan, M., Wright, O., … Brown, W. (2014). Shifting gears: Process evaluation of an activity tracker and smart phone application to promote healthy lifestyle choices in Australian truck drivers. *Journal of Science and Medicine in Sport*, *18*, e124. http://doi.org/10.1016/j.jsams.2014.11.097

Granado-Font, E., Flores-Mateo, G., Sorlí-Aguilar, M., Montaña-Carreras, X., Ferre-Grau, C., Barrera-Uriarte, M.-L., … Satué-Gracia, E.-M. (2015). Effectiveness of a Smartphone application and wearable device for weight loss in overweight or obese primary care patients: protocol for a randomised controlled trial. *BMC Public Health*, *15*(1), 531. http://doi.org/10.1186/s12889-015-1845-8

Hebden, L., Balestracci, K., McGeechan, K., Denney-Wilson, E., Harris, M., Bauman, A., & Allman-Farinelli, M. (2013). "TXT2BFiT" a mobile phone-based healthy lifestyle program for preventing unhealthy weight gain in young adults: study protocol for a randomized controlled trial. *Trials*, *14*, 75. http://doi.org/10.1186/1745-6215-14-75

Hebden, L., Cook, A., van der Ploeg, H. P., King, L., Bauman, A., & Allman-Farinelli, M. (2014). A mobile health intervention for weight management among young adults: a pilot randomised controlled trial. *Journal of Human Nutrition and Dietetics : The Official Journal of the British Dietetic Association*, *27*(4), 322–32. http://doi.org/10.1111/jhn.12155

Knippr, M., Baumann, A., Hofstetter, C., Korte, R., & Krawinkel, M. (2015). Internationalizing Medical Education: The Special Track Curriculum "Global Health" at Justus Liebig University Giessen. *GMS Zeitschrift Für Medizinische Ausbildung*, *32*(5), Doc52. http://doi.org/10.3205/zma000994

Laing, B. Y., Mangione, C. M., Tseng, C.-H., Leng, M., Vaisberg, E., Mahida, M., … Bell, D. S. (2014). Effectiveness of a smartphone application for weight loss compared with usual care in overweight primary care patients: a randomized, controlled trial. *Annals of Internal Medicine*, *161*(10 Suppl), S5–12. http://doi.org/10.7326/M13-3005

Lee, J., Park, D.-S., Jeong, Y.-S., & Park, J. (2015). Live Mobile Distance Learning System for Smart Devices. *Symmetry*, *7*(2), 294–304. http://doi.org/10.3390/sym7020294

Linde, J. A., Jeffery, R. W., Crow, S. J., Brelje, K. L., Pacanowski, C. R., Gavin, K. L., & Smolenski, D. J. (2015). The Tracking Study: description of a randomized controlled trial of variations on weight tracking frequency in a behavioral weight loss program. *Contemporary Clinical Trials*, *40*, 199–211. http://doi.org/10.1016/j.cct.2014.12.007

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Martin, C. K., Miller, A. C., Thomas, D. M., Champagne, C. M., Han, H., & Church, T. (2015). Efficacy of SmartLoss SM , a smartphone-based weight loss intervention: Results from a randomized controlled trial. *Obesity*, *23*(5), 935–942. http://doi.org/10.1002/oby.21063

Moynihan, S., Paakkari, L., Välimaa, R., Jourdan, D., & Mannix-McNamara, P. (2015). Teacher Competencies in Health Education: Results of a Delphi Study. *PloS One*, *10*(12), e0143703. http://doi.org/10.1371/journal.pone.0143703

O'Brien, T., Troutman-Jordan, M., Hathaway, D., Armstrong, S., & Moore, M. (2015). Acceptability of wristband activity trackers among community dwelling older adults. *Geriatric Nursing (New York, N.Y.)*, *36*(2), S21–S25. http://doi.org/10.1016/j.gerinurse.2015.02.019

Oberer, B., & Erkollar, A. (2014). Tablets as primary educational computing devices. An impact analysis on the educational landscape in an Austrian university. *Procedia -Social and Behavioral Sciences*, *116*, 477–480. http://doi.org/10.1016/j.sbspro.2014.01.243

Obesity. (n.d.). Retrieved December 13, 2015, from http://www.who.int/topics/obesity/en/

Pellegrini, C. A., Pfammatter, A. F., Conroy, D. E., & Spring, B. (2015). Smartphone applications to support weight loss: current perspectives. *Advanced Health Care Technologies*, *1*, 13–22. http://doi.org/10.2147/AHCT.S57844

Rawassizadeh, R., Price, B. A., & Petre, M. (2015). Wearables: Has the Age of Smartwatches Finally Arrived? *Communications of the ACM*, *58*(1), 45–47. http://doi.org/10.1145/2629633

Spring, B., Duncan, J. M., Janke, E. A., Kozak, A. T., McFadden, H. G., DeMott, A., ... Hedeker, D. (2013). Integrating technology into standard weight loss treatment: a randomized controlled trial. *JAMA Internal Medicine*, *173*(2), 105–11. http://doi.org/10.1001/jamainternmed.2013.1221

Stoian, A.C. (2015). *Evaluarea competențelor elevilor - exemple de armonizare a metodelor complementare/alternative cu cele tradiționale*. București: Editura Universitară.

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