



How Technology Is Being Used to Foster Student Wellbeing & Enhance the Value of Collegiate Recreation

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Introduction

THERE HAS BEEN A BOOM IN TECHNOLOGY TARGETING HEALTH. There are many types of new technology that target various facets of a user's health, such as fitness, nutrition, sleep, and mental health. These technologies can provide massive amounts of information: they measure exercise, nutrition, progress, and equipment use. These data collected provide information for individual users that support their health goals. Smartphone apps (e.g., MyFitnessPal), wearable devices (e.g., FitBit), gym equipment technology (e.g., Preva), and electronic healthcare systems (e.g., Epic Systems) are all so popular that not only is it likely that many students are familiar with one or more of these technologies, it is probable students expect to use these technologies to varying degrees in their daily lives. Further, the data collected additionally provide numerous benefits for campus recreation to understand student users. Institutions can incorporate these new technologies to engage with student users, to support their health goals, and to collect data that benefits the management of recreational facilities.

Contents

- 2. Introduction
- 3. New Technologies
- 11. Conclusions
- 12. References

In this paper, we first present popular types of fitness and health technology that exist. We highlight the benefits of these technologies both for student users and for college recreation administration. We additionally address issues related to these new forms of technology, including measurement, motivation, and privacy concerns. Finally, we make suggestions of how campus recreation can incorporate these new technologies to optimize use and to bridge the gap between personal devices and recreational and health programs.

New Technologies

How Individual Users Can Use Technology

There has been a recent rise in the popularity of wearable devices, such as FitBit, JawBone, and Nike+. These have various capabilities depending on brand and model, but the most common of which counts steps, providing an overall assessment of activity. Unlike basic pedometers, these wearable devices sync with smartphone apps to provide estimated caloric burn of logged exercises (e.g., type of activity, intensity); to count calories of food logged by users (often by syncing with a separate smartphone app focused on nutrition); to map runs, walks, or bike rides using GPS; to track sleep; and to graph trends of these statistics over time to indicate progress. Thus, these wearable devices target multiple aspects of health of concern to students: fitness, nutrition, and sleep. However, these devices can be expensive; for example, the JawBone Up, the most basic and inexpensive model, costs \$49.99 (JawBone, n.d.; Nike+, n.d.; FitBit, n.d.).

A more cost-effective route may be smartphone apps and websites, which can be used to focus on physical health in addition to mental health. Table 1 (next page) provides several examples of these apps, their cost, and their focus. Many of these apps and websites track both nutrition and fitness via user input. For example, MyFitnessPal provides nutritional information for food and calorie burn estimates of exercises. Unlike a wearable device, the user-inputted exercises may be less accurate if users over- or under-estimate their activity levels or food portions. MyFitnessPal suggests guidelines for calories and macronutrients based on the user's current weight, height, gender, activity levels, and weight goals. It also provides a community; users can read and post to forums for encouragement, recipes, and workout ideas. Finally, it produces reports to track progress (MyFitnessPal, n.d.).

Table 1: Examples of Smart Phone Apps Focusing on Health

Smart phone app	Cost	iPhone/Android	Focus
C25K Couch to 5K	Free	Both	Exercise
CBT Thought Record Diary	Free	Both	Mental Health
FitStar	Free	iPhone	Exercise
Johnson & Johnson Official 7 Minute Workout App	Free	Both	Exercise
LiveStrong's MyPlate	Free	Both	Exercise, Nutrition
MapMyFitness	Free	Both	Exercise
MyFitnessPal	Free	Both	Exercise, Nutrition
Nike+ Training Club	Free	Both	Exercise
Pocket Yoga	\$2.99	Both	Exercise
Quit Smoking Assistant	Free	Both	Routines/Habits
Relax and Sleep	Free	Android	Sleep
RunKeeper	Free	Both	Exercise
StepJockey	Free	Both	Exercise
Stop, Breathe, and Think	Free	Android	Mental Health
Swag'r	Free	iPhone	Social Media/Promotions

Source Google Play and iPhone app stores.

There are countless fitness apps and websites focused on fitness. Apps, such as MapMyFitness or RunKeeper use GPS to provide a visual representation of their workout (walking, cycling, running, hiking) along with the length, time, and estimated caloric burn of one's workout (MapMyFitness, n.d.; RunKeeper, n.d.). Research finds that smartphone apps which act as pedometers are as accurate as wearable devices (Reynolds, 2015) making them an attractive alternative for many college students.

Other websites and smartphone apps go beyond tracking one's fitness by suggesting specific workouts. Couch25K is a smartphone app that guides beginners via audio cues during a series of workout to go from mostly walking with some running to running a full 5k (Active, n.d.). More broadly, FitStar is an app meant to mimic a personal trainer; it provides videos of various workouts that build in intensity over time (FitStar, n.d.). A benefit of these apps and websites is that these workouts can be done anywhere at any time for little cost—unlike working out with a personal trainer—and can motivate users by tracking progress and sharing with a community.

Further, mental health, sleep, and halting bad behaviors (e.g., smoking) can be promoted through various apps. Apps, such as CBT Thought Record Diary, allow for quick journaling as a means to reduce stress and negative feelings using the psychological theory of cognitive-behavior therapy (CBT Thought Record Diary, n.d.). There are apps for guided meditation or sounds of meditation, such as Stop, Breathe, & Think (Stop, Breathe & Think App, n.d.). Additionally, there are apps to track sleep or help users fall to sleep by providing white noise, like Relax and Sleep (Relax and Sleep, n.d.). Finally, apps can be used to stop bad behaviors; for example, the app Quit Smoking Assistant helps users to stop smoking by reducing dependency on nicotine over time (Quit Smoking Assistant, n.d.).

Currently, there is not a consensus about whether these wearable devices and smartphone apps actually change behaviors. Proponents for these technologies argue they are inherently motivating: they turn fitness and nutrition into a game, in which users compete with themselves (and others) into upping their step count, staying under a calorie goal, or going to bed earlier. Additionally, these apps can be used to share achievements (e.g., run statistics, weight loss) with friends and community, which motivates users to continue with healthy habits by boasting of their progress and allowing others to encourage the user (Beckham, 2012). While the benefits of using these new technologies may be hard to measure, the introduction of these technologies reinforce the important idea it is necessary to reflect on one's habits for a healthy lifestyle (The Associated Press, 2015).

Others argue that these new technologies do not do enough. While some apps and devices can nudge you toward going to bed earlier or reaching a daily step-count goal, few specify what activities you should do instead or rely on big data which work for a generic average user, but not the individual (Beckham, 2012; Pierce, 2015; The Associated Press, 2015). A second-generation of devices are being developed which can provide an additional push toward good habits, such as using location sensors to remind users to buy vegetables when near a grocery store (Pierce, 2015) or using multiple sensors to understand how your body is moving holistically rather than a simple step count (Quinlan, 2015).

It is important to note that behavioral change comes from users of technology, not the technology itself (Carroll, 2014). That is, self-selection may account for positive outcomes of using these new technologies. Those who want to change their habits invest in wearable devices and

smartphone apps and continue to use them. However, approximately half of buyers almost immediately stop using these devices (Pierce, 2015). Because wearable devices are so new, there are not many peer-reviewed studies on the effects of use, especially among young adults. In the next section, we address how institutions can mitigate these issues by motivating students to incorporate and continue to use new technologies as part of a health plan and by further using big data to understand the needs of students.

How Institutions Can Use Technology

Institutions can use technology, like social media, to interact with student users and teach them about various aspects of health. Campus recreation staff can virtually meet and interact with students through websites and social media. Students can register for “first come, first serve” classes online, which may increase participation as students would know they have a place. Universities can use smartphone apps, like Swag’r, to advertise to students. Swag’r uses a smartphone’s location to identify nearby merchants and send promotions to students to entice students to come into gyms and use health services (Swag’r, 2015). Social media and apps can be the first step to engage students, and campus recreation staff can follow up for more personal interactions.

Further, technology can be used to instruct students on fitness. The website for University of Kentucky’s Campus Recreation provides short videos posted on Vimeo, a video hosting website, which walk through the proper use of every piece of gym equipment available (University of Kentucky, n.d.). These videos are used by students new to a fitness program and unsure of how to properly use gym equipment, reducing potential frustrations and injuries. A website additionally provides a means to advertise ongoing programs, events, and general information about facilities to students.

Technology, such as Preva, MYZONE, and Technogym’s MyWellness Apps, are used by campus recreation facilities to obtain new members and retain existing members by increasing the tools members have to reach fitness goals. Preva is software that works with Precor’s cardio equipment. Users can identify goals, save favorite workouts, and measure progress across different machines by storing these data in a cloud. Another benefit of this technology is that management knows which machines are used

most often and when to switch these out to prolong the life of a machine. Similarly, Technogym's MyWellness Apps help recreational facilities in two ways. First, their Profile app gathers information for each user on their fitness aspirations: Power, Sport, Balance, Fun, Move, and Shape. Using these categories, recreational facilities know which programs to offer and can communicate with specific users about programs that may interest them. Second, similar to the Preva system, the Technogym's Asset app provides feedback to Technogym about fitness equipment so that problems can be reported automatically and instantaneously. Finally, the MYZONE system uses a microchip inside a special belt that records heart rate data. Because belts are bought by gym members, they can be used when exercising outside of the gym, which may be an attractive draw for students who live on campus only part of the year. These data are uploaded to a personal tracking page, giving users individualized information about their progress. However, the data can only be uploaded at the fitness club, giving management the opportunity to communicate face-to-face with members about programs and events (Zabonick, 2013).

Many universities offer institutional support for those looking to get in shape, like the University of Kentucky's Time to Change Lifestyle Change Program (University of Kentucky, n.d.) and the University of Pennsylvania's PennSHAPE Challenge (University of Pennsylvania, n.d.). Universities can incorporate the smartphone apps as part of a challenge. Step Jockey is a smartphone app that enables institutions to create a sign for stairwells rated for calorie burn that app users can scan to track calorie burn. Step Jockey claims that such signage is an effective means to get people to use stairs, and institutions can create stair climbing challenges (StepJockey, n.d.). Typically, institutions provide support with one-on-one advisement with nutritionists, group workouts, and fitness assessments. In a comparison of working with a personal trainer to using two smartphone apps, FitStar and MyFitnessPal, journalist Molly Wood concluded that working with a personal trainer gave her the push start needed to begin a health program—she felt she could not miss a session, had an personalized workout that avoided reinjuring a hurt ankle, and was pushed to work out harder—but that the apps were what she would count on in the long term (Wood, 2015). Thus, users of health programs, like those at the University of Kentucky and the University of Pennsylvania, could benefit by the incorporation of apps for long-term health management after the initial face-to-face consultations and personal training.

Another benefit of using technology to record health data is the ability for campus recreation to work with student healthcare providers and to monitor behavior through apps or wearable technology. IBM's artificial intelligence, Watson, is being partnered with three companies, Apple, Johnson & Johnson, and Medtronic to provide personalized health care to patients using an Apple Watch, those with knee and hip replacements, and those with diabetes, respectively. Goals include remotely monitoring improvement or spotting potential trouble. For example, Medtronic wants to use Watson to "automatically adjust insulin doses and send alerts to care providers and the patients themselves" for patients in trouble (Lohr, 2015). Universities can follow suit and share information from wearable devices and smartphone apps between campus recreation and healthcare providers, such as doctors and therapists, to provide a more holistic health plan. Microsoft's HealthVault can be used to track and share health data from apps and devices, like Preva and Wi-Fi scales, in addition to allowing doctors to send secure emails to a patient's account. HealthVault was named PCMag's editor's choice health service in 2014 (Duffy, 2014).

However, the collection and sharing of big data raise a number of concerns. First, student users may not want to share information, especially private health information. Obtaining consent is critical, though more important is the assurance that technology systems in place can safely transmit and store these sensitive data. Even with this assurance in place, students may not want to use technology that is seen as nagging; "one of our biggest concerns was that if technology caught patients not doing what they were supposed to, they'd stop using it" (Carroll, 2014). Second, it is possible that doctors and therapists will not respond well to this information overload; one-third of physicians reported missing test results because they were overwhelmed by alerts and data. If institutions were to incorporate these data sharing systems, regulations regarding workloads must be adjusted accordingly. Third, the logistics of data sharing can be problematic. In 2009 the Health Information Technology for Economic and Clinical Health (HITECH) Act, which encouraged health care providers to use electronic record keeping systems, did not account for differing systems across medical facilities that are unable to communicate with one another. It is important to carefully plan and account for the requirements of information systems before implementing a system. Moreover, depending on the system, companies like Epic and Apple are closed regarding data access. This means that it is possible that students who would like to maintain their data after graduation may actually lose it. Finally, the

financial costs of these systems are great (Carroll, 2014), especially in light of concerns by students of rising tuition rates. Still, the long-term savings should be explored. In a study of Cleveland Clinic employees, those “who met step-counting or activity goals could save about \$2,000 a year in out-of-pocket health care spending” (The Associated Press, 2015).

How Institutions Can Incentivize Health through Technology

As previously discussed, new technologies do not necessarily cause changes in behaviors despite all the information they provide. However, institutions can incentivize changing behaviors in ways that an individual cannot. Behavioral economist, Katherine Milkman, compared the fitness patterns of three groups of undergraduate students across nine weeks to study self-control. One group of undergraduates was given one of four audio books chosen by the study participant (e.g., *The DaVinci Code*, *The Hunger Games*), which could only be accessed at the gym via a loaned iPod; another group was given access to the audiobook via their personal iPods, and a control group was not given an audio book. Milkman finds that the first group was significantly more likely to attend the gym compared to the other two groups. She calls this idea “temptation bundling,” in which two activities—one you should do, like fitness, and one you love to do, like reading a popular novel or watching a popular television show, are combined to mitigate problems of self-control (Milkman, 2013). Gyms could use this idea by providing access to specific television shows, movies, or audio books while using cardio equipment to entice students.

Additionally, there are apps and websites that financially incentivize health. PactApp is an app in which users commit to a goal (i.e., go to the gym, eat more vegetables, log food) for a certain number of times per week. When users fail to reach the goal, they are charged money. When they reach the goal, they receive a portion of the money that other users had to pay for that week (Pact, n.d.). AchieveMint similarly rewards users with \$25 after earning 25,000 points by using a wide variety of health apps (e.g., MyFitnessPal, RunKeeper, Quit Smoking Assistant) (AchieveMint, n.d.). Like these programs, the University of Minnesota provides students with a personal online wellness account, which students can use to record fitness and food as well as sync wearable devices, such as FitBit and Polar Heart Rate Monitors. They incentivize the use of this wellness account by

allowing users to collect points, which students can use to purchase meal plans and fitness equipment (University of Minnesota, n.d.). The previously mentioned PennSHAPE Challenge at the University of Pennsylvania was a contest among graduate students with prizes (University of Pennsylvania, n.d.). Programs such as these that monitor fitness and nutrition data can be fun ways to encourage students to maintain a healthy lifestyle.

Conclusion

There are numerous new health technologies in place which campus recreation can harness to engage students and encourage a healthy lifestyle and there are even more developing. These technologies are not without their problems; issues of motivation and measurement may inhibit true behavioral change for many student users, while privacy concerns of data security and cost may inhibit the use of these new technologies completely. We offer some suggestions to implement technologies that may mitigate these problems, including incentivizing tracking of fitness and nutrition. Incorporating these technologies by campus recreation should be explored as they benefit both students and institutions.

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