

Educational Standards and the Future of Digital Badging
in Response to the COVID-19 Pandemic:
A Promising Alternative for Reinforcing Student Competencies

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Abstract

The COVID-19 pandemic necessitated sudden and unprecedented changes in the delivery of higher education across the globe. Such changes included but were not limited to transitioning instructional strategies from face-to-face to online platforms, and modifying and/or changing learner outcomes to accommodate a wider range of student abilities and disabilities, resources and technologies, and geographic locations. At the same time, academic and professional bodies such as the American College of Sports Medicine (ACSM), which has been responsible for establishing and enforcing professional standards for certification and accreditation, have needed to adapt their standards to qualifying students matriculating in undergraduate and graduate degree programs, many of whom have taken courses for but have not gained experiences in a traditional face-to-face laboratory course. For this reason, a growing number of academic and professional institutions, including the Health Sciences program at Drexel University, have begun to think about how courses during and beyond the COVID-19 pandemic can be reimagined with a conversion of traditional face-to-face quarter or semester term credit hours being replaced with a number of knowledge, skill, and ability areas set forth by governing bodies for professional certification, accreditation, and licensure. This paper will be framed through the lens of the Exercise Physiologist Certification and analyzes the standards set forth by organizations such as ACSM, the National Physical Activity Society (NPAS), and the Centers for Disease Control and Prevention (CDC), to demonstrate how educational professionals can identify methods for improving student fluency in the knowledge, skills, and abilities necessary for obtaining professional certification in the exercise sciences. The necessity of ACSM's *Exercise Testing and Prescription*, along with its application in the context of the COVID-19 pandemic, will also be evaluated. The paper will highlight the real-world standards expected of applicants pursuing ACSM's Exercise Physiologist Certification and address how post-secondary education faculty could feasibly design, implement, and evaluate digital badging as an alternative to traditional credit or term loading. Each standard will be specifically related to the work currently being done in the Digital Badges Program, a pilot study currently in preparation by the author's team which aims to assess and evaluate the objective learning measures of student success with ACSM's Core Competencies and Knowledge, Skills, and Abilities (KSAs) in real-time during an undergraduate exercise testing and prescription course.

Educational Standards and the Future of Digital Badging in Response to the COVID-19 Pandemic: A Promising Alternative for Reinforcing Student Competencies

During the COVID-19 pandemic, millions lost their sense of physical connectedness with normal life. Physical separation was recommended to control the spread of COVID-19, but led to heightened levels of loneliness, hopelessness, anxiety, and depression, negatively impacting people's ability to sustain their social networks.¹ Economic woes and high death counts exacerbated these effects; however, the most concerning and perhaps long-lasting effect from the pandemic is its impact on physical health and well-being.

Americans were not adequately prepared for a physically restrictive quarantine. A lack of access to exercise and fitness equipment coupled with unhealthy eating habits facilitated an average weight gain of 40 pounds for people in the United States. Given that physical inactivity, overweight and obesity were already public health concerns before the pandemic, qualified exercise professionals capable of designing, implementing, and evaluating weight management programs will be needed to control risk factors linked with chronic diseases.

As the world lives with the realities of the pandemic, employers recognize a need to hire candidates capable of being flexible and mobile in both clinical and applied settings. However, the mechanism for how colleges and universities should best prepare their students for these careers remains unclear. The learning curve of online platforms such as Zoom led to a lack of student engagement, preventing instructors from accurately knowing how much time students put towards their education.² Hundreds of students matriculating in clinical professions were trained to perform face-to-face fitness assessments online, missing the physical engagement upon which these courses were founded. Most academics recognize that undergraduate courses should provide students with a foundation for developing critical thinking and reasoning skills;

¹ Pietrabissa, G. and Simpson, S. (2020). Psychological Consequences of Social Isolation During COVID-19 Outbreak. *Front. Psychol.* 11:2201. <https://doi.org/10.3389/fpsyg.2020.02201>

² García, E and Weiss, G. (2020). COVID-19 and student performance, equity, and U.S. education policy. *Economic Policy Institute*. Retrieved from <https://www.epi.org/publication/the-consequences-of-the-covid-19-pandemic-for-education-performance-and-equity-in-the-united-states-what-can-we-learn-from-pre-pandemic-research-to-inform-relief-recovery-and-rebuilding/>

however, courses should integrate adaptive learning models that provide opportunities to carry out the professional skillsets expected from employers for their chosen career path.

To increase student competencies in skill areas for professional certification and licensure, we are piloting a skill-based assessment tool called the Digital Badges Program. By flipping the class instruction paradigm and focusing on skill-based trajectories, the program digitally tracks the acquisition of core skills, outlines career expectations, and provides evidence of real-world skillsets that students can include on their resume. The following sections will explain why postsecondary education would benefit from a Digital Badges Program, illustrate what a Digital Badge application could look like, and reveal how the program could be feasibly incorporated into a current exercise science curriculum.

American College of Sports Medicine Standards

The National Physical Activity Society (NPAS) and the Centers for Disease Control and Prevention (CDC) co-produced the Core Competencies and Knowledge, Skills, and Abilities (KSAs) to spotlight the essential areas of competency for exercise physiologists. The American College of Sports Medicine (ACSM), a trusted source in exercise science and sports medicine, revised and expanded the KSAs to encompass core capabilities required for successful careers in health and fitness.³ In 2017 the ACSM conducted a job task analysis to inform what content should appear on their Exercise Physiologist Certification (EP-C) Exam⁴, and the findings influence the practice-based KSAs for most exercise testing and prescription courses offered in undergraduate curricula.

Exercise Prescription: Job Tasks I.B and II.A

Job Tasks I.B and II.A provide a framework for how the ACSM approves a candidate's readiness to produce an exercise prescription. Job task I.B requires students to demonstrate their knowledge and skill when evaluating a client's ability to participate in a "health-related physical

³ National Physical Activity Society. (n.d.). *Core Competencies and Knowledge, Skills, and Abilities: Essentials for Public Health Physical Activity Practitioners*. Retrieved from https://www.acsm.org/docs/default-source/certification-documents/specialty/corecompetenciespaphs.pdf?sfvrsn=eba72975_2

⁴ American College of Sports Medicine. (2020). *ACSM Certified Exercise Physiologist Exam Content Outline*. Retrieved from https://www.acsm.org/docs/default-source/certification-documents/acsmep_examcontentoutline_2020.pdf?sfvrsn=d413f75_16

fitness assessment and exercise program,” while II.A challenges students to develop safe exercise prescriptions for a designated outcome or goal. An undergraduate able to successfully fulfill these tasks would be able to identify cardiovascular, metabolic, and renal disease risk factors and determine if medical clearance is needed. Students proficient in Job Task I.B would be able to identify physiologic changes caused by short- and long-term bouts of exercise and recognize contraindications precluding a client’s exercise ability.⁴

However, Pezeshki et al. (2019) reported that health sciences students struggle to perform tasks in common clinical settings without receiving hands-on training. In 2019 the authors found that prior to an educational intervention, less than 20% of fourth-year medical students adequately performed 9 of the 16 blood pressure measurement skills, including proper placement of the cuff and stethoscope. After two weeks of hands-on training, over 70% of students performed 14 of the 16 skills correctly.⁵ Such a rapid turnaround in acquiring highly dynamic skills appears to be well-suited for the fast-paced quarter term at Drexel University, and simulations with remote instruction using real-world clients demonstrated promising opportunities for civic engagement. Verification of health-fitness assessments and exercise prescriptions could be feasibly measured in an online environment using an iterative Client Project: Students enrolled in an undergraduate exercise testing and prescription course identify someone they live with as their client for an exercise prescription. Students develop their own informed consent form, evaluate their client’s preparticipation health history, and write a report on their client’s readiness for an exercise program. The students then perform a health/fitness assessment on their client and use the data to inform the design, implementation, and evaluation of an appropriate exercise prescription with guidance from the instructor.

To help students appreciate the iterative process, segments of the Client Project are due every few weeks to discourage procrastination and provide opportunities to practice and establish proficiency. The Client Project is therefore an objective measurement of the student’s skill that saves on costs and allows for adaptation of the course curriculum to benefit students using their

⁵ Pezeshki, M., Moghaddas, F., and Ghaffari, S. (2019, December 30). Educational intervention improves measurement of blood pressure skills in Iranian medical students. *Research and Development in Medical Education*, 8(2), 80-84. <https://doi.org/10.15171/rdme.2019.016>

own resources and equipment or lab-based equipment. Laboratory experiences include the creation of videotaped health/fitness assessments with accessible equipment, which offers students a flexible range of choices to demonstrate their knowledge and understanding of the health/fitness assessments in practical settings akin to where they will practice in the real-world.

Exercise Implementation: Job Tasks II.B and II.C

Once students develop an ability to prescribe exercise in accordance with their client's health/fitness status and goals, Job Tasks II.B and II.C charge students with administering the prescription. Comprehensive in-person and remote practice of the KSAs ensure students have a thorough knowledge of the critical skillsets and expertise required of exercise physiologists. Musculoskeletal injuries, for example, can happen to anyone regardless of their age, experience, or physical activity level. A 2020 survey of 2,003 United Kingdom adults found that 14% had either hurt or injured themselves while engaged in physical activity during COVID-19, usually from pulling a muscle or injuring their knees or back.⁶ Students, therefore, should be expected to know which equipment is safe and effective for their clients to use when performing health/fitness assessments and designing exercise prescriptions, and know how to modify the prescription when incorrect form is identified. Furthermore, implementing the exercise prescription requires exercise physiologists to determine the relative energy and oxygen costs of prescribed exercise and know how to monitor exercise intensity with calculated estimates of heart rate reserve and maximum oxygen consumption.

In an educational setting, implementing an exercise prescription focuses on mastering the skills learned with either face-to-face or online learning environments. Skills like blood pressure assessments and body compositions often require measurements on different volunteers, classmates, and partners. For the Digital Badges Program, students prepare for these assessments by repeating applications of such skills during laboratory experiences, case study scenarios, and with the Client Project. The students integrate their knowledge by aggregating data from the exercise assessment – caloric expenditures, peak oxygen consumption, heart rate response, etc. –

⁶ *Millions of Brits on fitness kicks suffer lockdown injuries.* (2020, June 9). Bupa. Retrieved from <https://www.bupa.com/newsroom/news/lockdown-sport-injuries>

and analyzing these metrics to demonstrate how their client's health/fitness status may impact their exercise prescription, if at all.

The ACSM EP-C Certification exam will be modeled as part of the Digital Badges Program. The midterm and final exams, previously proctored as separate exams, are combined to simulate the 200-question EP-C exam. Additionally, students model the live oral exam by completing either a face-to-face or remote-based practical exam with actors or classmates role playing as the student's client. During the practical exam, students must demonstrate an ability to perform the KSAs of the exercise physiologist, from the pre-participation health screening to the health/fitness assessment. Students are not aware of the client's health history before the exam and receive pre-exercise evaluation test results from a simulated physical exam.

After completing these exams, students are notified and rewarded for the skills they were capable of demonstrating competence in as part of the Digital Badges Program. The program's novel grading approach prohibits the all-or-nothing dynamic of a credit-based system where a poor final grade overshadows the actual progress students make on a class-by-class basis. Rather than completing a task in a specified time frame, the Digital Badges Program reimagines the student's overall experience and celebrates learning moments when KSAs are mastered.

Weight Management Programs: Job Tasks I.F and II.E

In a February 2021 survey, 42% of Americans reported gaining more weight than they intended during the COVID-19 pandemic, amplifying the need for successful weight management programs.⁷ Studies have shown evidence of a strong linkage between overweight and obesity and poorer COVID-19 side effects and outcomes. Pooled data from a meta-analysis of 75 papers discovered that obesity increased the odds of COVID-19 infection by 46% and morbidity by 48%.⁸ Factors contributing to these findings included an association between an increased body

⁷ *One year on: Unhealthy weight gains, increased drinking reported by Americans coping with pandemic stress.* (2021, March 11). American Psychological Association (APA). Retrieved from <https://www.apa.org/news/press/releases/2021/03/one-year-pandemic-stress>

⁸ Popkin, B. M., Du, S., Green, W. D., Beck, M. A., Algaith, T., Herbst, C. H., Alsukait, R. F., Alluhidan, M., Alazemi, N., & Shekar, M. (2020). Individuals with obesity and COVID-19: A global perspective on the epidemiology and biological relationships. *Obesity reviews : an official journal of the International Association for the Study of Obesity*, 21(11), e13128. <https://doi.org/10.1111/obr.13128>

mass index and a greater concentration of anti-inflammatory CD4 T cell lines, which counteract immune responses needed to fight infectious agents.⁷ Likewise, overweight and obesity impairs the development of memory immune cell populations, and angiotensin converting enzyme inhibitors could appear to worsen COVID-19 severity in people living with Type 2 diabetes.⁷ For these reasons, a push for more robust and flexible measurement tools⁹ and a goal to train students with well-rounded curriculum appear to be vital in tackling overweight and obesity during and beyond the COVID-19 pandemic.

In a synchronous class setting, students receive one week of body composition assessment training by first reviewing published position statements from the ACSM and the American Dietetic Association (ADA) on the associated risks and pathophysiology of obesity. Students are then trained in the performance of the assessments by the instructor and practice the assessment techniques repeatedly on a volunteer or lab partner. The KSAs learned in the laboratory setting are then repeated on different individuals of varying body types, with university-approved disinfectant and contact tracing protocols in place. After successfully replicating the assessments, students culminate their learning experience by recording and performing the assessment on their client for the Client Project and calculate their client's fat/fat-free mass, body fat percentage, goal weight, caloric deficit, and timeline to achieve the goal weight.

After completing each activity, students receive points towards obtaining a digital badge for the experience. To obtain the digital badge, students must earn 100 points towards the targeted experiences, which includes but is not limited to students demonstrating abilities to identify client comorbidities, analyze the client's health/fitness status, and produce an evidence-based exercise prescription. By removing the negative associations of difficult work and replacing them with mastery-by-repetition experiences, the Digital Badges Program offers a structured approach toward learning and developing skills included within the ACSM's job task analysis and embraces Drexel's commitment to civic engagement through experiential learning.

⁹ Lemond, D. and Laube, J. (2021, March 17). *How BMI Came to Define Obesity, and Why This Measure is Flawed*. Everyday Health. <https://www.everydayhealth.com/diet-nutrition/bmi/bmi-flaws-history-other-ways-measure-body-weight/>

Conclusion

In a truly unprecedented time in modern history, humanity has suffered from social isolation, a lack of connectedness, and an increase in body weight. Qualified health/fitness professionals, including exercise physiologists, will be needed to prevent and treat overweight and obesity for the future. However, shortcomings and challenges in delivering skill-based courses in higher education during the pandemic have created obstacles for students seeking to acquire the KSAs required by ACSM's certification standards. Students completing coursework for the ACSM EP-C and other professional certifications and licensures therefore need to receive a foundational understanding of the principles of exercise testing and prescription. The Digital Badges program shifts the focus from a credit-based system to a badging system by rewarding students for acquiring the KSAs for exercise science and sports medicine careers. The program thereby offers health and exercise science majors an unprecedented opportunity to qualify as agents for change that fulfill society's needs as they exist today and will exist in the future.

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