

Dance Wellness Pedagogy
A Mixed-Methods Approach to Developing, Implementing, and Evaluating a
University-Level Dance Wellness Curricular Framework

by
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A Bound Document Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Fine Arts

Approved April 2021 by the
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May 2021

ABSTRACT

This research study aimed to develop, implement, and evaluate the effectiveness of a dance wellness educational curriculum administered in a university-level dance classroom. Using a mixed methods design involving a pre-test/post-test performance assessment and document analysis for qualitative data, this study asked two questions: 1) How does participation in a semester-long course on Group Fitness Instruction and dancer wellness increase participants' comprehension of exercise science and fitness instruction concepts? 2) How does participation in a semester-long course on Group Fitness Instruction and dancer wellness impact participants' personal approaches to teaching, training, and wellness? Results showed that the post-test scores were significantly higher than pre-test scores, and qualitative data collected from participants indicated deep levels of meaning-making and application of course content to personal approaches to training and teaching. This suggests that incorporating a dance wellness curriculum in a university-level dance program builds exercise science, wellness, and instructional literacy, while encouraging students to apply gained knowledge in both personal and professional capacities.

ACKNOWLEDGMENTS

My deepest appreciation for my outstanding committee members. Specifically, I would like to thank:

Eileen Standley for encouraging me to continue to develop and advocate for my voice as an artist, educator, and researcher.

Becky Dyer for supporting my passions and dreams as an educator and guiding me during each step.

Pamela Kulinna for helping me to put my ideas into words and encouraging my confidence in myself as a researcher.

In addition, I offer my gratitude, love, and thanks to all of my family. And an especially important thank you to my parents, Monte and Cindy Drew for always encouraging my passions and dreams, and for their endless love and support. I love you.

To my amazing cohort and fellow dance graduate students at Arizona State University – thank you for being with me every step of the way. And to Nicholas Herring-Harman, I could not have done this without you, and I cannot thank you enough for your compassion and encouragement.

Last, to all of my friends and loved ones who have become my second family and my home away from home. Without your care, compassion, and love, I would not be the woman that I am today. Thank you.

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PROLOGUE

I have a strong passion for and knowledge base in exercise science and the fitness industry; I am a Group Fitness Instructor certified by the American Council on Exercise, a Level 1 Neurokinetic Therapist, and have many hours of undergraduate coursework in anatomy, kinesiology, physiology, and dance science. With this knowledge base, I understand how the body works and how it functions under specific performance demands. During my graduate education at Arizona State University, I began to explore the relationship between exercise science/fitness training and dance performance in greater detail; I began to examine existing literature regarding dance and fitness and deepened my understanding of how fitness informs my personal dance training.

Many dance styles involve aerobic and glycolytic energy systems during performance, indicating that dance performance is high-intensity interval exercise in nature; however, it has been found that the exercise intensity levels reached in a dance technique class or rehearsal are not sufficient to prepare dancers for the required intensity of dance performance (Irvine, Redding & Rafferty, 2011; Koutedakis, 2005; Rodrigues-Krause, Krause & Reischak-Oliveira, 2015; Wyon, 2005). Further, several studies have indicated that incorporating muscular strength training can improve physical performance without compromising technical or aesthetic components of performance (Koutedakis, Stavropoulos-Kalinoglou & Metsios, 2005; Koutedakis & Sharp, 2004; Panhan, Gonclaves, Eltz, Villalba, Cardozo & Berzin, 2019). As a result, I decided to follow these recommendations and devised my own personal training schedule, designed to specifically enhance my dance performance and improve my body composition. I

integrated high intensity interval training (HIIT) cardio sessions, alongside vigorous muscular strength and endurance training, into my workout sessions, and adopted changes to my eating habits based on recommendations from existing research (Berardi, 2005; Bryant, Galati, Green, Matthews & Jo, 2018; Challis, Stevens, & Wilson, 2016; Clarkson, 2005). The results of this health journey were that I had never felt more stable and strong with my dance technique; I noticed my power, speed, and endurance with dance movement had greatly advanced, my mobility/flexibility had drastically improved, and I had even lost 30 pounds.

After several months of continuing this routine, I had intensely worked out almost every day of the week on top of having hours of dance class and rehearsals daily, had become hyper-aware of and restrictive towards my caloric and macronutrient intake, was obsessive about my body, and was at a dangerous level of physical burn out. During this time, my mental health had begun to decline drastically, despite the gains I was seeing in my physical health. Even though I was doing what I was supposed to do to enhance my health, I was experiencing guilt and shame nearly every minute of every day; shame about my body for still not being ‘good enough,’ guilt over my eating habits and not meeting my caloric or macronutrient requirements, shame for the unrealistic expectations I held for myself, and guilt towards my inability to achieve the unrealistic expectations I thought others held me to. The health routine that I had crafted based on existing research eventually drove me into a mental state where I subconsciously developed disordered eating patterns, unhealthy exercise patterns, and a debilitating perception of my body.

While this period in my life was and continues to be, incredibly challenging, it brought with it a beautiful realization – I had no idea how to be aware of or advocate for

my own wellness, and I did not know how to live an optimal and healthy life. Regardless of the physical, mental, and emotional stress that I willingly put myself through during this time, I was able to understand that while I had the information that I needed to be successful in these aspects of my health, my approach in applying this information was not safe, balanced, or holistic. A plethora of dance science research and literature exists suggesting how dancers should train to enhance their strength and stability, train their cardiorespiratory endurance more effectively, optimize their dance performance, and even prevent injury. My experience sparked an interest to research and uncover practices, frameworks, and ideas to put more awareness and action towards the other equally important aspects of my health and wellness, including occupational, physical, spiritual, emotional, intellectual, and social wellnesses. Given this information and my personal history, I believe that the framework and context in which dancers learn and apply this information is just as important as, if not more important than, the information itself.

CHAPTER 1

REVIEW OF LITERATURE

Upon examining current research and literature related to dance science, dance wellness, and the psychosocial and occupational demands of dancers, it is clear that there are overlooked and/or under-represented components in the educational training of university-level dance students. First, there exists a need for a deeper understanding and application of exercise science literacy amongst the university dance population for the means of safe and balanced training practices, performance optimization, and injury prevention. Second, current areas of academic focus for university dance students reveal a need for the development of wellness-related behaviors and skills to better cope with the physical and psychosocial demands of dance training and performance. Third, that there is the potential to expand the university-level dancers' personal and professional capacities by incorporating aspects of dance wellness within current curricular structures. Ultimately, the development and implementation of a dance wellness educational curriculum within the university-dance setting could address often overlooked or under-represented needs of dance students while enhancing the multidimensional aspects of their wellness and providing knowledge and skills for higher success upon graduation.

The Need for Exercise Science Literacy Amongst Dancers

The importance of strength and cardiovascular supplemental training for dancers as a mechanism for preparation to meet the demands of performance is a pivotal and necessary concept for dancers to understand and apply in order to optimize their performance and maintain their overall health and wellness. And while this concept is

crucial for dancers to embody, Rodrigues-Krause, Krause & Reischak-Oliveira (2015) found that aerobic and anaerobic cardiovascular levels (endurance) achieved in a dance technique class or rehearsal is insufficient physiological training to prepare the body for the demands of dance performance (Rodrigues-Krause et al., 2015). Meaning that the cardiovascular work performed in dance training and rehearsals does not meet the demands needed for dance performance and as a result, dancers face high levels of overuse and/or traumatic injuries caused by overtraining, low energy intake (nutrition), and/or exercise-induced fatigue (Berardi, 2005; Rodrigues-Krause et al., 2015). Such factors are influenced by the attention and effort given by an individual dancer towards integrating supplemental training (cardiovascular endurance, training with maximum overload, resistance/flexibility training), proper nutrition, and adequate recovery periods into their wellness routine. Without proper knowledge and education in exercise science, dancers may not be aware of these specific physiological needs that must be met for performance optimization, effective training, and their overall safety as performing artists.

Exercise science encompasses various crucial areas of study necessary for dancers and dance educators to not only comprehend, but to be able to apply towards their own training and their approaches to training and teaching others. These areas of study include anatomy, kinesiology, physical training principles, exercise programming, nutrition, injury prevention tactics, and oftentimes wellness practices. Not only is exercise science comprehension and application necessary for dancers to reap the physiological benefits of informed and safe training, but this knowledge will build their literacy in dance science research and literature. Unfortunately, the depth of knowledge needed to fully

comprehend and critically apply ideas presented in dance science research and literature may be a barrier to those without an existing exercise science knowledge base. Staying up to date on dance science research and literature is vital for dancers and dance educators to ensure that they are implementing science-based training and teaching methods that are safe and effective. When uninformed on science-based training and teaching methods, dancers are put at an even greater risk for injury due to burnout, poor alignment, insufficient fitness levels, and ineffective training practices.

Performing complex movement sequences repeatedly, as found in most dance styles, requires a high level of precision, endurance, power, and strength. Without such aspects of physical fitness and control, the body will be unable to cope with the stressors of repeated, complex movements and dancers will be put at a greater risk of injury.

Dance-related injuries are not uncommon – ballet dancers face on average 1.9 injuries per 1,000 hours of dancing, be that in rehearsal, class, or performance (Novosel, Sekulic, Peric, Kondirc & Zaletel, 2019). This statistic roughly translates into 1-2 injuries every 25 days, assuming the average professional ballet dancer is dancing 40 hours per week, and accounts for both acute injuries involving a traumatic/sudden onset, such as a lateral ankle sprain, and chronic injuries with a nontraumatic/gradual onset, such as plantar fasciitis. Regardless of the onset of the dance injury, insufficient or poor muscular strength, aerobic capacity, and body composition are contributors to poor technique and/or alignment, by resulting in an abnormal loading on joints and surrounding tissues which can cause injury (Koutedakis, Clarke, Wyon, Aways & Owolabi, 2009). Further, increases in the volume of exercise while decreasing rest/recovery periods significantly impact the risk of a dance-related injuries (Koutedakis et al., 2009). These findings

indicate that the dance population may be under-educated on not just the importance of exercise science literacy, but how to train/teach dancers safely and effectively, along with the importance of wellness, nutrition, and rest/recovery for dancers. By seeking to address dancers' lack of comprehension and integration of exercise science literacy in a higher education dance context, the next generations of dancers and dance educators may be able to approach dance training and teaching from a safer, science-based, and informed perspective.

Examining Dance Training in Higher Education

When training and educating dance students in the postsecondary context, oftentimes the students' technical skill level, performance abilities, and physical appearance/body composition become the primary focus. Cardinal (2009) noted this, along with many other apparent health-related issues within their higher education dance student population:

In addition to general pressures such as independence from parents and financial constraints, the specific pressures placed upon dancers include physical demands such as extreme bodily movements from a variety of dance forms; extended hours of physical overuse in technique classes, rehearsals, and performance; possible anatomical limitations and/or faulty technique and body alignment; the common requirement for ultra-lean, sub-normal body weight; and stresses associated with performance anxiety, competition, perfectionism, distorted body image, preoccupation with body weight, unbalanced lifestyles, and life transitions. (p. 29)

Dancers, particularly dance students within higher education, face internal and external pressures to meet and exceed the high demands required from the artform. Not only do dancers encounter the physical demands of maintaining and improving their flexibility, strength, power, and endurance to perform at elite levels, but they are often faced with additional demands of long hours of technique classes, rehearsals, and performances (Potter & Galbraith, 2004). On top of that, eating disorders, poor body-image, and poor nutritional choices largely saturate the dance culture (Challis, Stevens & Wilson, 2016). The impact of these physical, temporal, and mental pressures directly relates to a student's ability to perform their best within their classes, rehearsals, performances, and life.

Higher education is quite often a period of time for students to develop professional and life skills to build healthy behaviors and habits that they will carry into adulthood. However, within higher education dance programs, technical training and artistic choreographic endeavors are often the focus of the learning experience. According to the National Association of Schools of Dance Handbook (2019), higher education dance programs have the responsibility to educate students on the technical/creative, theoretical, historical, and teaching components of dance. While the creative and technical components of dance education are undoubtedly crucial and significant to the development of the technical dancer, choreographer, and performer, Griffith, Gearhart, Sugimoto, Geminiani & Stracciolini (2019) distinguish that “dancers must learn that life skill development, be it in a degree-bearing collegiate pursuit or otherwise, does not hinder technique; rather, it seeks to improve performance by contributing to the person as a whole,” (p. 51). Further, the psychosocial impact of

attending college largely shapes students' social and emotional development, behaviors, and skillsets that students will carry through their professional lives. Cardinal (2009) analyzed existing literature surrounding various health-related issues facing dance students in higher education and found that "behaviors formed during student dancers' intensive college/university dance education will directly relate to the behaviors they will practice beyond their education and during their dance careers," (29). Integrating wellness programs within higher education dance programs, or even regularly including wellness practices within existing courses, has the potential to provide a more holistic approach towards dancers' education, training health, and wellbeing. Considering that the psychosocial implications of the higher education experience are highly formative to dancers' professional abilities and capacities, dance educators should consider the role that wellness education and wellness practices play in the advancement of student health, wellbeing, and success.

Addressing the overlooked components of wellness within dance education may impact dancers' abilities to sustain successful, healthy, and expansive careers in the field of dance by building and enhancing beneficial, supportive, and productive professional development, life skills, and healthy behaviors. Potter and Galbraith (2004) suggest that wellness programs in a higher education dance context could include educational components, resources, and screening protocols on anatomy, kinesiology, nutrition, and psychology. While conducting a content analysis study on dance-wellness related coursework in the United States' higher education dance programs between 1990, 1997, and 2008, Cardinal (2009) found that by 2008, 31.5% of undergraduate dance programs did not offer a dance science or wellness related course. Further, of the programs that did

offer some dance-science/wellness related courses, the majority only offered a single course in either anatomy/kinesiology or body therapies/somatics (Cardinal, 2009). These findings indicate that the field of dance education has historically disregarded the necessity of dance wellness-related courses that span beyond anatomy/kinesiology and body therapies/somatics within higher education dance programs. As such, there is a need for dance educators to address dancer wellness in higher education by promoting the interconnectedness of students' physical, social, occupational, spiritual, intellectual, and emotional wellness to contribute to healthy behaviors, lifestyle choices, and professional skills.

There are other aspects of wellness that seem to be unintentionally excluded from the typical student's dance training; the National Institute of Wellness identifies Six Dimensions of Wellness – occupational, physical, intellectual, spiritual, emotional, and social – that are interconnected and when equally promoted and addressed, can lead to optimal and healthy living (Hettler, 1976). By addressing the Six Dimensions of Wellness within a postsecondary dance context, dance educators will be able to take a holistic and psychosocially aware approach towards dance education, as students will be able to develop professional and life skills that expand beyond the realm of dance performance, composition, and theory. Such skills might include:

- Supplemental physical fitness training to enhance dance performance.
- Nutrition for appropriate body composition, self-fulfillment, and performance optimization.
- Developing self-confidence, neutral or positive body-image, and healthy coping skills for major life stressors.

- Effective communication skills and learning to advocate for the self and others.
- Recognizing and managing emotions and associated behaviors.
- Identifying, developing, and living by their beliefs and values in both personal and professional capacities.

Understanding *Wellness* and *Dance Wellness*

The concept of *wellness* can have a multitude of interpretations and can be molded to fit different perspectives and contexts. The National Wellness Institute put forth a holistic model of wellness, conceptualized by Bill Hettler in 1976, which outlines the six dimensions of wellness one should consider in order to live a balanced and more fulfilling life. This interdependent model provides a multidimensional view of wellness, including occupational (work fulfillment), physical (health and fitness), social (community/environmental connection), intellectual (knowledge and skills), emotional (feelings toward self and life), and spiritual (search for meaning/purpose) wellness.

Wilmerding and Krasnow (2017) analyzed the connection between wellness and dance by applying Hettler's Six Dimensions of Wellness Model (1976) to a dance training context. By focusing more specifically on the mental and physical components of dance training, they drew the following connections:

- Occupational wellness relates to the environment and physical space in which dancers train.
- Physical wellness involves a dancer's technique, injury prevention strategies, and physical conditioning.
- Social wellness connects to the competitive nature of the dance environment.

- Intellectual wellness relates to the mind-body connection and exploring contextual dance information.
- Spiritual wellness encompasses understanding personal value and beliefs and developing a purpose within the dance field.
- Emotional wellness embraces psychological issues often accompanying dancers, such as body image, stress, and perfectionism.

When pursuing a physically and mentally demanding career pathway, such as dance performance, it is crucial that students build and develop balanced and holistic views towards the multidimensionality of their wellness, as it can directly relate to their personal and professional growth development. The Six Dimensions of Wellness Model offers a framework that, when applied in a dance educational context, can provide a more holistic and balanced approach to dance education.

While Wilmerding and Krasnow (2017) applied Hettler's Six Dimensions of Wellness Model (1976) within a dance-specific context, it is still necessary to understand how exactly *dance wellness* is defined. Upon analyzing existing literature, Cardinal and Hilsendager (1997) synthesized their findings to craft a perceptive and holistic definition of dance wellness as "an area of dance comprised of a wide array of components that share the common goal of the overall health and well-being of the dancer as related to increased qualitative and quantitative performance potential," (p. 68). With their definition begin centered on improving the outcome of dance performance, The Ohio State University offers a similar definition, but with perhaps a more specific focus and application, defining dance wellness as "a field of study and practice that is concerned with the well-being and health in the dancer to improve career longevity, reduce the risks

of injury, and enhance performance,” (para. 1). This definition explores the “qualitative and quantitative performance potential” that Cardinal and Hilsendager (1997) aim to improve with their approaches to dance wellness, by focusing specifically on injury prevention and performance enhancement to thus improve career longevity. Regardless, there appears to be a consistent and fundamental understanding that dance wellness is centered on the health and wellbeing of the dancer, with a level of application in the professional realm through the extension of performance capacities.

Applications of Dance Wellness

Many researchers and educators have explicitly advocated for the integration of dance wellness curriculum and/or supplemental dance wellness programs within the college/university setting to ensure the holistic development of the maturing dancer (Cardinal & Hilsendager, 1997; Clark, Gupta, Ho, 2014; Cardinal, 2009; Potter & Galbraith, 2004; Wilmerding & Krasnow, 2017). Clark, Gupta, and Ho reflect on the idea that many perspectives exist on the methodological options to implement a dance wellness program, stating that “the goal of many wellness programs is to improve artists’ health; but how to achieve this goal and determine the most effective strategy to tackle this complex challenge remains uncertain,” (p. 1-2). Often, researchers and educators offer components of a dance wellness program, including assessment/screening processes, on-site healthcare including physical therapy and various educational methods including courses, modules, and resources (Cardinal & Hilsendager, 1997; Clark, Gupta, Ho, 2014; Potter & Galbraith, 2004). While a clear and direct connection between the

healthcare field is often involved in a dance wellness program, there is still a need to focus on educating dancers on wellness-related practices, concepts, and content.

Cardinal and Hilsendager (1997) have worked to synthesize and systematize the necessary components of dance wellness education that are critical for dance students, particularly university-level dance students, to understand and apply during their educational experience. They outlined the ten curricular components/content areas that encompass dancer wellness, including anatomy, physiology, biomechanics, body therapies, dance injuries, nutrition, personal health, psychology, and combined motor learning, motor development and motor control (Cardinal & Hilsendager, 1997, p. 68-69). Similarly, Potter and Galbraith (2004) articulated that “wellness programs may include screening protocols and educational components not only in kinesiology and anatomy but also in both nutrition and psychology in the hopes to address a fuller scope of dancer health,” (p. 2). In addition to educational components, some dance wellness programs focus on providing information regarding screening, assessment, and performance capacities through the collection of data and facilitating relationships between healthcare professionals (i.e., physical therapists, massage therapists) and dancers (Potter & Galbraith, 2004; “Dance Wellness Clinic,” n.d.). These perspectives indicate a focus on the structures and functions of the physical body, the connection between the body and mind (also referred to as psychosomatics or somatics), and how to care for both the body and mind for optimal wellness and performance within a dance wellness program or curriculum.

When instituting dance wellness education within a higher education curriculum, Cardinal and Hilsendager (1997) further proposed that the objectives of dance wellness education should be centered on:

- Effective injury prevention, treatment, and rehabilitation,
- Efficient and effective methods of dance training,
- Optimal levels of conditioning, health, and well-being of dancers,
- Increased self-care among dancers, and
- Extended careers in dance (p. 68).

By integrating the suggested components/content areas and by considering the outlined objectives of a dance wellness curriculum, students will learn how to properly, efficiently, and safely care for both their bodies and their minds. And if a dance educator provides a robust and holistic educational experience for their students, they will be able to develop all aspects of their wellness and will be better prepared to address and cope with the physical and mental demands that a career in dance performance often evokes.

Expanding the University Dancers' Professional Capacities

Many students who graduate from postsecondary dance programs enter into the professional world hoping to attain and sustain a career in dance performance and/or choreography. While these aspirations are honorable, the fields of dance performance and choreography do not appear to be promising fields for sustainable careers. There are disproportionately fewer available positions within the field of dance compared to the number of recent dance graduates, resulting in a highly competitive job market and career environment (Bennett & Bridgstock, 2014; Griffith, Gearhart, Sugimoto, Geminiani &

Stracciolini, 2019). In addition, the U.S. Bureau of Labor Statistics (2021) informs that while the employment change for dancers and choreographers in the next 10 years is 6% growth, the projected employment change is an increase of 1,000 professionals. While these statistics are not dismal, it is important to keep in mind that oftentimes, dance companies and choreographers will hire dancers on a project-by-project basis, preventing consistent work, and/or offer part-time over full-time contracts, resulting in insufficient pay for professional dancers (Bennett & Bridgstock, 2014). Regardless of the little projected growth within the industry, dancers will continue to face a competitive and potentially unsustainable future as performing and creative artists.

This projected un- and underemployment within the field of dance and choreography within the next 10 years is a harsh reality, but the reasons for such a lack in job opportunity expand far beyond a decreased market for dancers and choreographers. Many dancers encounter a sudden and unplanned end to their performance careers due to a lack of job availability, sporadic and unsustainable work, and/or chronic or acute injury (Griffith et al., 2019). Further, Bennett's (2009) survey of 71 Australian dance artists pursuing careers in performance found that 90% of respondents reported that they held additional career-related roles aside from their work as a dance performer, and 64% of survey respondents reported changes in their performance-based careers resulting from the need for more stable employment and a higher salary. Most of Bennet's (2009) 71 survey respondents also identified a need for transferable skills for employment outside of dance performance, such as self-management, communication, leadership, and business management – a need that had not been met within their previous formal dance training. Educating dancers on the occupational realities of the fields of dance

performance and choreography is un- or under-addressed within the postsecondary context, a context in which this information is necessary to present to dancers.

Upon entering a competitive and unsustainable dance performance job market, the psychological implications dancers face involves feeling and/or being ill-prepared for the occupational, social, intellectual, and emotional hardships of attaining and sustaining a successful career (Griffith et al., 2019). Many dancers ultimately turn towards alternative careers or sources of supplemental income to support themselves as they pursue their artistic work. The competitive reality of an oversaturated job market requires that dancers possess the skills, education, and resources to successfully prepare for the physical, social, temporal, occupational, and emotional demands of a career as a dance artist.

To address the issue of un- and underemployment, many dance artists turn towards teaching dance as a means to supplement their income. Although dance education and teaching are viable fields for supplemental employment, these fields may also reach saturation as more dancers enter the professional world upon graduating colleges and universities. In interviewing dancers on their expected career plans versus their actual career realities upon recent college graduation, Bennett and Bridgstock (2014) found that employment gaps in the dance performance field present a burden for dancers to maintain their professional-level performance skills, technique, and physical fitness. When professional performance work becomes scarce and dancers must turn towards other creative or non-creative employment options, available time and finances to maintain physical fitness and dance technique can also become scarce (Bennett & Bridgstock, 2014). Entering the fitness industry can present an opportunity for dancers to maintain and improve their physical fitness, provide monetary and spatial resources to

maintain their technique, and provide income potential in a field with clear projected growth and expansion.

The fitness industry can provide a logical bridge for dancers who seek to supplement their income and employment and enhance their training practices. The U.S. Bureau of Labor Statistics (2020) states that “employment of fitness trainers and instructors is projected to grow 15 percent from 2019 to 2029, much faster than the average for all occupations” (para. 1). Further, fitness trainers and instructors will see a potential employment change of 57,600, a significant increase from an employment change of 1,000 for dancers and choreographers (U.S. Bureau of Labor Statistics, 2020). When examining potential supplemental income sources for future generations of dance artists, a supplemental career in the fitness industry provides a job market that will grow faster on average *than any other occupation* within the next 10 years (U.S. Bureau of Labor Statistics, 2020). For upcoming dance professionals, there is innate value in expanding their skillsets towards the fitness industry as a means to seek supplemental income and available employment; working as a fitness trainer or instructor can allow dancers stay physically active between their work with freelance projects or part-time work and enhance their understanding of the training needed to maintain or improve their physical fitness. By expanding their knowledge of exercise science and training principles, dancers will not only expand their potential source of income but can improve their own fitness levels and performance abilities and enhance their skills as instructors and teachers.

Fitness certification programs, like the American Council on Exercise’s (ACE) Group Fitness Instructor (GFI) certification, are readily available, nationally accredited,

derived from scientific evidence, and provide a logical step for dancers to enter into a fitness career. Many of these programs are self-paced, which provides the ease and flexibility to study for and take the exam on one's own timeframe. In addition, GFIs develop valuable professional and life skills that can be transferred to other contexts, including communication, leadership, teaching strategies, and versatility (Riebe, 2012). The training content and context for the ACE GFI certification may provide aspiring professional dancers with the adaptability, transferability, and supplemental employment opportunity needed to sustain a successful career as a performing artist.

While many fitness certification programs are self-paced and self-taught, through the use of a textbook and practice exams, the process of obtaining a GFI certification on one's own can be time consuming, costly, and may feel overwhelming; this may be particularly true for those without any previous knowledge of exercise science concepts and/or training principles. Further, a self-paced, self-taught, textbook-driven certification program can be viewed as aligned with traditional teaching methods that focus mainly on verbal and written methods of communication. However, traditional teaching methods put students who do not exhibit a verbal learning style at a disadvantage towards this format of self-instruction and assessment. With dance being a movement-based, kinesthetic artform, Gavenhorst (2007) hypothesized that dancers may exhibit a strong preference towards active learning styles. The study's pre-test/post-test research design utilized the Felder-Silverman Index of Learning Styles to assess the preferred learning styles of university dance students. Of the 19 dance students assessed, 58% exhibited visual and active learning preferences, suggesting that dance students may benefit from a blend of visual and active teaching methods. A predisposition towards visual and active

learning styles suggests that asking dancers to study for a fitness certification program by reading the information in a textbook and later recall and apply that knowledge to pass a certification exam may not best serve their pedagogical needs. If dancers were to learn the depth of exercise-science knowledge needed to become a certified GFI within a higher education context, implementing teaching methods and approaches that align with dancers' active and visual learning styles would be most productive and effective.

The content needed to pass a GFI certification exam is based heavily on exercise science and instructional methods – concepts that are critical for dancers and dance educators to understand and apply within their praxis. Gaining knowledge and skill with exercise science content and instructional methods will directly impact dancers' occupational, physical, and intellectual wellness, as this gained knowledge can be applied to both personal and professional capacities. For example, gaining proper experience with exercise programming, nutrition, anatomy/kinesiology, etc., will help dancers make more educated choices within their own training and their approaches to teaching, as they can train and/or teach to prevent injury and optimize performance. Further, becoming a certified GFI will open professional opportunities within the fitness industry that students might not have had available to them prior, providing the prospect of additional supplemental income as they pursue their careers as performing artists and/or dance educators. Ultimately, adopting a wellness-based curriculum centered around the content knowledge needed to become a certified GFI will allow dancers to train and teach more effectively and efficiently, provide further occupational development, and help them to understand and advocate for the multidimensionality of their wellness.

CHAPTER 2

METHOD

Purpose

The purpose of this research study was to develop a curriculum that focuses on building exercise science literacy, applying that literacy in a fitness and dance context, and enhancing understandings and applications of wellness and wellness practices.

Research questions that were addressed in this study include: 1) How does participation in a semester-long course on Group Fitness Instruction and dancer wellness increase participants' comprehension of exercise science and fitness instruction concepts? 2) How does participation in a semester-long course on Group Fitness Instruction and dancer wellness impact participants' personal approaches to teaching, training, and wellness?

Participants

The participants in this study were 7 undergraduate students at ASU, with varying academic backgrounds. The descriptive table (table 1) outlines each of the participants, including their name, pronouns, academic major, and year in school.

Table 1

Descriptive table of all research participants

Participant Name*	Pronouns	Academic Major/Program of Study	Year
Kaylee	She/her	BFA in Dance Education with a certificate in Arts Entrepreneurship	Junior
Susie	She/her	BFA in Dance Performance with a certificate in Entrepreneurship and Innovation	Senior
Aaron	He/him	BFA in Dance Education	Senior
Maria	She/her	BFA in Dance Performance	Freshman

Nicole	She/her	BFA in Dance Education with an Energy & Sustainability certification	Junior
Esteban	He/him	BFA in Dance Performance with a minor in Communication and an Energy & Sustainability certification	Senior
Justin	He/him	BS in Biology	Senior

**All names listed are pseudonyms to protect the identities of the participants.*

Design and Procedures

Before intervention lessons were implemented, approval through the Institutional Review Board (IRB) was obtained, and consent was obtained from all participants.

Design

This mixed methods, quasi-experimental research design measured knowledge in one group of participants before (pre-test) and after (post-test) the implementation of the experimental curriculum (independent variable), to measure the participants' level of knowledge of exercise science and instructional methods (dependent variable).

Quantitative data (content knowledge assessment) was the predominant data collected, with qualitative data serving a supportive role.

Procedures

During each class meeting, participants experienced: a lecture provided by the researcher on an exercise science, fitness, and/or wellness related topic, engaged in question-asking and meaning-making discussions, and participated in a form of reflective application, often involving a movement activity or form of instructional practice.

Assessments of knowledge were not given throughout the semester, aside from the pre-test/post-test content knowledge assessments at the start and end of the semester. Work completed both in and out of class meetings helped to prepare participants for their Final Blueprint Project (Appendix C) in which they had to apply their knowledge to design, plan, and lead both a group fitness class blueprint and a dance class blueprint.

Research Setting

This study took place in one university class designed to prepare dancers and dance teachers with a focus on exercise science and wellness knowledge. Instruction throughout the course remained the same, with 1 hour and 15-minute virtual Zoom class meetings twice a week for 15 weeks.

Table 2

Lessons/Content Taught in the Course During the Semester

Unit/Sub-unit	Number of Classes	Concepts Covered
Motivation and Goal Setting	2	<ul style="list-style-type: none"> • Motivating factors • Maslow’s Hierarchy of Needs • Extrinsic vs. intrinsic motivation • Background on goal setting • The SMART Goal Setting Model
The NWI’s Six Dimensions of Wellness	2	<ul style="list-style-type: none"> • Occupational wellness • Physical wellness • Social wellness • Intellectual wellness • Spiritual wellness • Emotional wellness • Why wellness matters for dancers
Anatomy and Kinesiology		<ul style="list-style-type: none"> • Directional terminology

Skeletal System	4	<ul style="list-style-type: none"> • Axial skeleton (skull, hyoid, vertebral column, thoracic cage) • Appendicular skeleton (shoulder girdle, upper extremity, pelvic girdle, lower extremity) • Tissues (connective, epithelial, muscle, nervous) • Bone development and structure • Tendons and ligaments • Joints (focus on synovial joints) • Planes of movement (frontal, sagittal, transverse)
Muscular System	2	<ul style="list-style-type: none"> • Muscle structure • Muscle contractions (isometric and isotonic) • Functional muscle pairs (agonist, antagonist, synergist) • Major muscles/muscle groups/actions (quadriceps, hamstrings, calves, abductors, adductors, hip flexors, the core, spinal flexors, lateral flexors, upper arm, chest, lateral back, medial back)
Other Body Systems	2	<ul style="list-style-type: none"> • Immune system – functions and structures <ul style="list-style-type: none"> ○ Immune responses ○ Immune function/responses and the gut • Lymphatic system – functions and structures • Inflammation • Digestive system – functions and structures
Nutrition	2	<ul style="list-style-type: none"> • Macronutrients vs. micronutrients <ul style="list-style-type: none"> ○ Carbohydrates, fats, proteins ○ Water consumption • Reading nutrition labels • Calculating calories per serving of macronutrients • Calculating basal metabolic rate (BMR), daily caloric intake values, and daily macronutrient values
Training Principles	4	<ul style="list-style-type: none"> • The kinetic chain • Stability vs. mobility • 5 primary movement patterns (bend-and-lift, single-leg, upper body push, upper body pull, rotation) • Health-related components of physical fitness (cardiorespiratory fitness, muscular strength, muscular endurance, body composition, flexibility) • Skill-related components of physical fitness (agility, balance, power, coordination, reaction time, speed) • Energy pathways (aerobic, anaerobic, phosphagen, glycolytic) • Tracking exercise intensity (ACE Three-Zone Intensity model, Ratings of Perceived Exertion)

Exercise Programming	6	<ul style="list-style-type: none"> • Adaptation and influencing factors (individuality, specificity, reversibility, progressive overload, variation) • Balanced training (bilateral movements, transitional/reversible movements, multi-planar movements, using opposing muscles/groups) • Group fitness class design (class formats, class objectives/goals, warm-up considerations, conditioning segment considerations, cool-down considerations) • Exercise progressions and regressions • The ACE Integrated Fitness Training Model (IFT)
Injuries, Injury Prevention, and Participant Safety	1	<ul style="list-style-type: none"> • Acute vs. chronic injuries • R.I.C.E. protocol • Emergencies and activating EMS • Exercising in the heat vs. exercising in the cold
Approaches to Teaching	3	<ul style="list-style-type: none"> • Domains of learning (affective, cognitive, psychomotor) • Stages of learning (cognitive, associative, autonomous) • Styles of learning (verbal, visual, kinesthetic) • Teaching methods (set-up, execution, cueing, transitions, rhythm) • Teaching strategies (slow-to-fast/half-time, repetition-reduction, part-to-whole/add-in, simple-to-complex/layering) • Music structure <ul style="list-style-type: none"> ○ Music in the foreground vs. background ○ Tempo/BPM for exercise modalities
Rest and Recovery	1	<ul style="list-style-type: none"> • Rest and muscular adaptation • Overuse, overtraining, and burnout • Physical rest strategies (periodization, pacing, scheduling considerations) • Practicing proactive self-care
The Role of a Group Fitness Instructor	1	<ul style="list-style-type: none"> • ACE Ethics • ACE Scope of Practice • ACE GFI responsibilities (health screenings, informed consent, providing adequate and proper instruction, providing adequate and proper supervision, inspecting facilities and equipment) • ACE legalities (liability insurance, copyright law, trademarks, shared use space)

Data Collection Instruments

The following instruments were used to gauge participants' knowledge, understanding, and application of exercise science concepts, instructional methods, and wellness practices.

Quantitative Data Collection Instruments

Content Knowledge Assessment. Participants' content knowledge of exercise science concepts and instructional methods was measured through pre-test and post-test content knowledge assessments, modified from the American Council on Exercise exam materials (Appendix A). These summative assessments, with a total of 74 questions, gauged participants' understandings of the following content areas. This Content Knowledge Assessment was modified from a previously validated assessment (The American Council on Exercise's Group Fitness Instructor Practice Exam, 2020).

- Group fitness class considerations (16%)
- Anatomy, kinesiology, and training concepts (26%)
- Monitoring and feedback (12%)
- Learning and teaching styles (12%)
- Exercise considerations and participant safety (16%)
- Nutrition (9%)
- Liability and professionalism (11%)

Qualitative Data Collection Instruments

Final Blueprint Project. During the final 2/3 of the semester, students began working on designing, planning, and teaching their own group fitness class blueprint. After receiving feedback from the researcher and their classmates, they made revisions to their fitness blueprint, and began designing and planning a dance class blueprint. At the end of the semester, participants completed the Final Blueprint Project (Appendix B), in which they submitted their revised group fitness class blueprint, their completed dance class blueprint, and the Comparative Analysis and Reflection (Appendix C). This Final Blueprint Project required participants to apply their gained knowledge in exercise programming, training principles, anatomy/kinesiology, participant safety, and instructional methods within both fitness and dance contexts. In addition, the Comparative Analysis and Reflection component required the participants to reflect on their process of designing, planning, and leading a group fitness class blueprint versus a dance class blueprint and reflect on the connections between fitness and dance instruction/training. Responses from the Comparative Analysis and Reflection became part of the Corpus of Data reviewed from qualitative data sources.

Wellness Journal Entries. Periodically, participants were assigned Wellness Journal Entries (Appendix D), in which they were asked to reflect on and apply the content explored during class meetings. In addition to focusing on course content, these Wellness Journal Entries had participants reflect on how the work in this class has impacted various aspects of their physical, emotional, intellectual, and occupational wellness. These assignments were completed both during and outside of class meetings.

Data Analysis

Quantitative Data Analysis

Descriptive statistics were calculated for all variables. A paired t-test was conducted to compare pre-post test scores for knowledge of exercise science and fitness instruction (figure 1). Analyzing the pre-post test scores allowed for interpretation of the effectiveness of the experimental curriculum (independent variable) on the participants' knowledge (dependent variable).

Qualitative Data Analysis

Qualitative data was continuously gathered during the course, primarily through the use of document analysis on class activities and assignments. Qualitative data was collected to understand and describe participants' experiences with and perceptions of the curriculum and course content/activities, their meaning-making processes, and their ability to apply and integrate new concepts, principles, and practices within their approaches to teaching and training.

Trustworthiness measures used included data triangulation across assignment sources, peer debriefing, and a search for negative cases. Two researchers independently reviewed all materials and came up with initial themes and subthemes. Negotiations took place resulting in two major themes and numerous subthemes.

CHAPTER 3

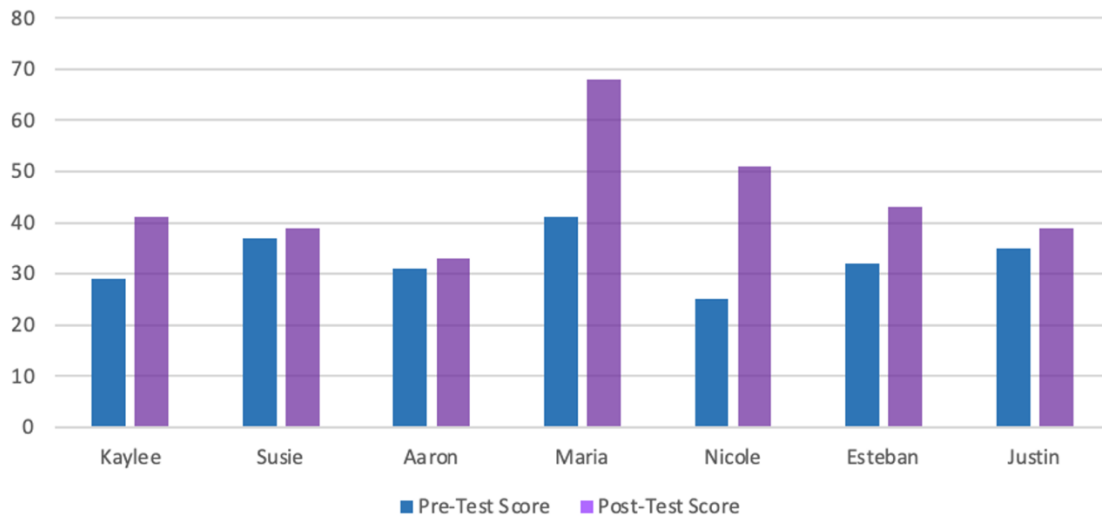
RESULTS

Quantitative Results

Post-test knowledge scores (M=44.9, SD=11.55) were significantly higher $t(6) = 2.97, p=0.012$, than pre-test scores (M=32.9, SD=5.30).

Results of the pre-post content knowledge assessment, covering exercise science and instructional methods, indicated a significant increase of content knowledge from pre-test to post-test. While every participant's score did increase in the post-test, interestingly, the standard deviation of scores also increased from pre-test to post-test, from SD=5.30 to SD=11.55, indicating a wider dispersion of knowledge amongst participants. When analyzing the difference between pre-post scores, the four senior students had the smallest growth in knowledge, with Susie gaining 2 points to her post-test score, Aaron gaining 2 points, Justin gaining 4 points, and Esteban gaining 11 points. Considering that these students were in their last year of college during their participation in this course, it is possible that they were preoccupied with senior capstone projects, graduate school applications, burnout, etc. resulting in their lower mean scores than their younger classmates. However, it is also noteworthy that this dispersion of knowledge may indicate that this information would be best presented earlier on in the educational experience.

Figure 1. Pre/post averages for content knowledge assessment.



Qualitative Results

As qualitative data was continuously gathered during the curriculum intervention, two primary themes began to emerge. Themes were narrowed further into subthemes, which were identified by reviewing the final Comparative Analysis and Reflection assignment (Appendix C), where participants reflected on their knowledge, experience, and skills gained throughout the entire semester. These themes and subthemes were then further supported upon the analysis of class assignments, reflections, and discussions which occurred throughout the semester.

Student Growth in Knowledge and Understanding Theme. The first theme that emerged was student growth in knowledge and understanding. After participating in a semester-long experimental curriculum, it was confirmed that students experienced changes in their knowledge and understanding of exercise science concepts, dance technique, and methods of instruction.

With many participants having prior dance and/or teaching experience, it became clear that several participants drew heavily on their existing knowledge during their experience in the course. In her Comparative Analysis and Reflection, Kaylee mentioned that “I have taught dance classes before, so it was easy for me to find structure and organization,” and Susie stated that “I believe I excel in my timing and cues. I have been dancing a long time and can rely on my instincts when it comes to timing.” And while this knowledge informed certain aspects of their work in the course, it was also revealed that participants were challenged to try new strategies and ways of thinking. For example, during the Approaches to Teaching unit of the course, the concept of cueing was introduced to participants, as a teaching method in which teachers or instructors provide short, well-rounded statements to guide their students’ movement and performance in real time. Conceptually, cueing was not a new concept for most, as the majority of participants had taken a fitness or dance class in the past. However, the framework and formatting of this concept provided participants with a new layer of information and skill to add to their existing knowledge of teaching. Susie touched on this idea in her Wellness Journal Entry, sharing that “the development of cues is recent [for me], but because I have been dancing so long, I have heard so many cues,” indicating that she was conceptually familiar with the concept of cueing, but had yet to learn specific techniques for cueing, or to apply cueing within her own teaching.

Participants were also challenged to plan and lead both a fitness class and a dance class, which revealed interesting dichotomies. As Kaylee reflected on the process of planning and leading her fitness and dance class blueprints (outlines), she stated, “the two blueprints differed in that one was completely dance-focused and the other fitness-

focused. They also differed in confidence on my end. I was more confident with the dance outline compared to the fitness outline.” This dichotomy of confidence likely relates to experience, as she went on to share in her Wellness Journal Entry that “this group fitness class was the first fitness class lesson plan I have ever created, and it was a bit overwhelming.” Similarly, Maria discussed the difference in complexity during her experience with the Final Blueprint Project. In her Final Blueprint Project, Maria’s fitness class focused on a goal of initiating movement through the core, with her class objective of sensing and understanding the connection between the core and its supporting muscles, and her dance class was centered on a goal of understanding weight shifts with a class objective of sensing weight shifts during complex movement phrases. Upon reflection of the process of planning these classes, Maria found that “when creating the fitness class, I was thinking of singular exercises that exercised muscle groups, but for the dance class, I had to create phrases that prepared the body for my [class] objective/goal of shifting weight dynamically.” Maria’s reflection indicates that perhaps a higher level of thinking, application, and organization is required to plan and teach a dance class blueprint, as the class goals/objectives can be more complex and dynamic in comparison to a fitness class blueprint.

Understanding the Relationship Between Fitness and Dance. A subtheme also emerged under the knowledge theme, that is, Understanding the Relationship Between Fitness and Dance. As participants entered this course with varying degrees of experience with fitness and dance, it was anticipated that many had not deeply analyzed the relationship between fitness and dance before this course. When prompted to reflect on

this relationship, rich and insightful observations revealed a sense of commonality between these two movement modalities.

In his Comparative Analysis and Reflection, Aaron shared, “I would describe fitness/exercise science concepts and dance technique as two apples from the same tree. Both activities focus on the knowledge of the body, especially the working of the body and its functions.” By comparing fitness and dance as “two apples from the same tree,” Aaron revealed that both movement modalities have similar bases in their intentions and goals, being their emphasis on the body and how it functions. Esteban elaborates on this idea in his Comparative Analysis and Reflection, stating that “the relationship between fitness and dance techniques are synonymous. Dance technique needs fitness technique in order to safely and effectively be performed.” Interestingly, Esteban’s reflections highlighted a sense of interdependency dance technique might have with fitness, ultimately concluding that a strong fitness basis is needed to dance effectively and safely. Similarly, Justin shared in his Wellness Journal Entry, “I think dance is a kind of extension of fitness. Fitness lays the groundwork for dancing like flexibility, strength, stamina. And dance is a more difficult fitness, it combines with more sophisticated techniques and graceful gesture.” These insights reveal a common understanding that a fitness basis is needed – with adequate flexibility, strength, and stamina as noted by Justin – to dance safely and effectively.

While the above statements reveal the basis of fitness required to effectively and safely execute dance movement, throughout the course, participants were asked to compare and analyze components of planning and teaching dance classes and fitness classes. Specifically, upon analyzing a dance technique class from a fitness/exercise

science lens, participants were able to understand the physical and mental needs of dancers to effectively and safely prepare for a dance class. Maria reflected in her Wellness Journal Entry that “dance technique is exercise and is very demanding on the body. Dancers must be properly warmed up and know how to prepare their bodies for demanding activities, as well as how to take care of themselves during and after those activities.” Maria’s statement elaborates on the above observations, and by labeling dance technique as a form of physical exercise, she indicates perhaps a deeper level of connection between dance and fitness/exercise science. Further, she reflects on why dance needs a fitness/exercise science basis, suggesting that a physiological approach is needed to properly prepare for dance activity and to better care for and protect dancers’ health and wellbeing.

Implementation/Application Theme. The second major theme that emerged from the data was Implementation/Application. As participants gained knowledge and understanding regarding the connection between fitness and dance, it became apparent that insights into personal and professional implementation and application of this knowledge and understanding began to develop.

Personal Implementation/Application. Under Implementation/Application, two subthemes emerged, personal and professional implementation/application. For the personal subtheme, a level of awareness regarding the importance of physical health and wellbeing emerged amongst participants, as shown with Kaylee’s observation that “as a dancer, it is important for me to apply fitness/exercise science concepts to my training

because they help me to understand my body better.” Similarly, Esteban reflected on how his expanded knowledge and understanding impact his training to prolong his physical health and wellness, stating that “I am applying these [fitness/exercise science] concepts in my own training so I can train to the best of my abilities and get as much out of it as possible. I will also be keeping my body preserved and safe for a longer-lasting body.” Both Kaylee’s and Esteban’s words indicate a benefit and need to apply their gained knowledge within their training in order to understand the body and its functions and to keep their bodies safe throughout their careers.

As many participants in this course either were planning to become or were currently dance teachers, the need for application and implementation of knowledge for personal growth and development deepened by further connecting it to approaches to teaching. For example, Maria stated in her Comparative Analysis and Reflection that “it’s important to understand fitness/exercise science concepts because as a dancer you have to know how to best treat and exercise your body, and as a teacher, you have to be able to lead students safely.” This comment indicates a higher level of thinking about the course material and application of course concepts, as Maria highlights that she first needed to understand fitness/exercise science concepts to care for her body before she could effectively and safely lead her students in their classes. Similarly, Kaylee shared in her Wellness Journal Entry that “as a dancer and teacher, I think it is important to apply understand and apply fitness/exercise science knowledge because the concepts provide me with a wider range of material to learn or teach,” indicating, again, application on both personal and professional realms.

While the physical benefits of increasing knowledge and understanding of fitness/exercise science knowledge was a prevalent theme, there emerged an increase in participants' body awareness and a deepening of their relationship to wellness. In reflecting on the impact of the course content, Kaylee shared in her Wellness Journal Entries that she felt that "[this course] provides me with a better awareness of my own body. I feel these concepts can help me discover the best ways for my body to move in and if the movement will truly be beneficial for me." Understanding how training impacts the body on a functional level proved to be insightful for Kaylee and granted her a greater sense of awareness of her body and how she moves. Susie noted that she felt a more global application, by focusing not just on the development of her physical wellness, but other aspects of wellness as well. She stated in her Comparative Analysis and Reflection that "I will apply this knowledge into my own practice by being more aware of my mental, physical, occupational, and social health. I hope to be able to make positive changes to my lifestyle with these wellness considerations in mind." Both Kaylee's and Susie's reflections indicated a level of application that spans beyond purely gaining the knowledge of safe training and teaching practices, but highlights that a greater understanding of fitness and exercise science concepts has helped them build a deeper relationship with their bodies and minds.

Professional Implementation/Application. The second subtheme was Professional Implantation/Application. As participants became more aware of and familiar with how fitness and exercise science concepts could benefit their training, their

reflections deepened and examined how this gained knowledge could be applied to better their approaches to teaching and thus their students' experiences.

Several participants noted the importance of sharing their fitness and exercise science knowledge to teach their students effectively and safely through their experience with exercise programming and increased knowledge of the body. For example, in his Wellness Journal Entry, Esteban reflected on the importance of applying this knowledge to his approaches as a dance educator, sharing the following:

It is important for me to understand and apply exercise science concepts into my teaching to familiarize myself with the functions of the body during physical activity for optimal performance and to prevent injuries in my classes. If I knew nothing of these concepts, I would blindly be leading a class through movement without taking safety precautions or making the best decisions for physical exercise. How could I possibly teach bodily movement without understanding how the body works? It is necessary to have this knowledge.

Esteban's words indicate a deep level of processing and application with his increased knowledge of the body, how it functions, and how to program classes efficiently; he highlights the importance of needing this knowledge by making safe decisions as an educator to prevent injuries and optimize performance in his students. Nicole reflected on how her increased understanding of exercise programming can influence her approach to planning classes, sharing that this growth in knowledge and experience will help her to "provide a class [where] I can fine-tune what I want to work on based on [my students'] stage of development." Similarly, Susie noted in her Comparative Analysis and Reflection that "being able to make lesson plans and know about anatomy, exercise

science, fitness, and wellness concepts will help me provide a well-rounded education to my students.” These reflections take into consideration that a greater understanding of fitness and exercise science concepts can drastically impact how a teacher plans their classes, leads their students, and ultimately cares for the safety of their students.

Similarly, several participants reflected on the impact of sharing this knowledge but reached perhaps a deeper level of implementation by investigating how their approaches to teaching can impact their students’ long-term health and wellness. Nicole analyzed the impact of her gained knowledge by sharing that “it is important to understand and apply [fitness/exercise science] concepts so that I can protect my students with correct knowledge...and teach them how to properly care for themselves.” This indicates recognition and desire to not only use this gained knowledge to teach more efficiently and safely but to help students understand the importance of caring for the body through informed movement and training. Further, Aaron shared in his Comparative Analysis and Reflection that “it is important to help students understand that dance still requires the use of muscles, meaning that if you aren’t providing the right needs for these muscles, you’re going to be working backward rather than forwards.” Again, Aaron’s comment demonstrates a drive to educate students on the body and how it functions to help students optimize their performance and ultimately care for their bodies in a more informed way.

Two participants in particular – Nicole and Susie – reflected on how this course content has specifically impacted their goals for their occupational development and ultimately, their occupational wellness. Nicole recalled her dance experience growing up, and how that, combined with her gained knowledge through this course, has impacted her

view on dance education and her goals as a future educator. In her comparative Analysis and Reflection, she shared:

My goal as a teacher is to be the teacher that I didn't have growing up. I will apply my newfound knowledge to my teaching practices so that I may guide my students towards a healthier dance style and give them the tools they need to be successful.

Connecting her newfound knowledge and experience to a specific goal related to her future as a dance educator provided Nicole with the drive and motivation to impact her students in a positive, informed, and health and wellness-focused way. Further, as the course content was framed through the content needed to become a certified Group Fitness Instructor, Susie commented on her ability to expand her occupational development given her gained knowledge and experience in this course, stating in her Comparative Analysis and Reflection that "I hope to be able to use this knowledge to become a certified fitness instructor." Susie's comment highlights the possibility and ability to apply knowledge and experience gained in this course to enhance professional capacities and occupational potential by embarking not just within the dance and education realms, but within the fitness industry as well. In reflecting on the impact that this course had on their abilities to plan, teach, and care for themselves and others effectively, participants were able to set tangible goals for their futures as dancers, educators, and even fitness professionals.

CHAPTER 4

DISCUSSION

The purpose of this study was to determine how students' knowledge and application of exercise science, wellness, and instructional practices changed throughout the semester-long curriculum intervention. Content covered in the curriculum involved exercise science concepts such as exercise programming, injury prevention and management, balanced training, as well as anatomy/kinesiology, instructional methods, and rest/recovery. The quantitative results of this study indicate a significant, positive change in content knowledge, demonstrating growth in participants' exercise science/fitness and instructional literacy. Qualitative findings support this growth and further explore how participants have applied and plan to apply their gained knowledge in personal and professional capacities. The qualitative findings revealed specifically how participants are currently implementing this content and will be able to implement it in the future, to train and teach more effectively, efficiently, and safely, which ultimately influenced multiple dimensions of participant wellness.

Through participation in this course, the intellectual, physical, and occupational dimensions of participant wellness were enhanced. By exploring contextual dance information within the course, intellectual wellness was addressed as participants were continuously stimulated and challenged with new content, concepts, and methods to approach their dance and fitness training and teaching (Wilmerding & Krasnow, 2017). Further, many participants reflected on how the knowledge they gained in this course supported and enhanced their existing knowledge and how their gained knowledge helped to evoke sensations of confidence in their skills and approaches as performing

artists and educators. Findings support participants increased intellectual wellness, given that every participant demonstrated increased levels of content knowledge following participation in the course.

Participants' physical wellness was also developed due to the nature of the experimental curriculum's content. Participants became more aware of and familiar with exercise science concepts and training principles through class lectures, activities, and movement experiences. Awareness of and familiarity with these concepts and practices echo Wilmerding and Krasnow's (2017) recommendation to address dancers' physical wellness by focusing on dance technique, injury prevention strategies, and physical conditioning. Further, this course introduced and explored various physiological needs of dancers, and participants were able to learn and experience how to meet and address those needs for themselves and their students. Aligning with recommendations and needs outlined in dance science literature, participants investigated the need for and methods to incorporate supplemental training, including cardiorespiratory endurance and muscular strength/endurance training, into their approaches to training and teaching (Berardi, 2005; Koutedakis, 2005; Koutedakis et al. 2005; Koutedakis & Sharp, 2004; Panhan et al., 2019; Rodrigues-Krause et al., 2015; Wyon, 2005). As participants learned this material and these concepts, they also directly applied it to their dance training and teaching strategies, leading to an increase in preparedness and ability to prevent injuries, optimize their performance, and improve the longevity of their careers as artists (Koutedakis et al., 2009; Novosel et al., 2019). Ultimately, by reflecting on the relationship between dance and fitness, it became clear that there is a need for fitness knowledge and experience amongst dancers as a method to improve their physical wellness.

Enhancing participants' occupational wellness was also integrated within the nature of course, due to the application of the course content within professional capacities, and by providing the knowledge and skills needed to become a certified GFI. Upon completing this course, participants have gained the knowledge, skills, and experience to both train and teach in a balanced, holistic, and informed manner. Further, while most of the participants have plans to pursue dance as their career following college, their participation in this course has not only enhanced their training and teaching abilities but has also provided the potential to expand their talents into the fitness industry, a highly successive field with immense projected growth (U.S. Bureau of Labor Statistics, 2020). As many professional dance artists turn towards teaching or other non-dance-related supplementary careers to ensure their financial wellbeing, participants of this course will now have greater access to sources of income and more strategic training and teaching practices upon graduation (Bennett & Bridgstock, 2014). By gaining the knowledge needed to become a certified GFI, and by advancing their approaches to teaching dance, through participation in this course, participants will be better prepared to meet the competitive and oversaturated dance-related job market and to face the associated psychological implications (Griffith et al., 2019).

The curriculum intervention designed for this research study aligned closely with the recommendations for dance wellness education (Cardinal & Hilsendager, 1997; "Dance Wellness Clinic," n.d.; Potter & Galbraith, 2004). Specifically, the content explored considered recommended subject areas of anatomy, physiology, kinesiology, dance injuries, nutrition, and personal health, and addressed the recommended objectives of injury prevention/rehabilitation, effective training, optimal conditioning, health, and

wellness, and extending careers in dance (Cardinal & Hilsendager, 1997, p. 68; Potter & Galbraith, 2004, p. 2). As the focus of this research project was education-based, it was appropriate and necessary to incorporate these content areas within the curriculum, as recommended by existing dance wellness research.

While recommendations for dance wellness programs support incorporating educational components and screening protocols, many also focus on building and fostering relationships between dancers and healthcare professionals. Potter and Galbraith (2004) discuss their work on Case Western University's Dance Wellness Program as incorporating educational components and providing access to resources for university dancers, but the key focus of this program involved the use of screenings, assessments, and online databases to help dancers track data related to their performance capacities. Further, The Ohio State University's Dance Wellness Clinic focuses on the injury prevention and rehabilitation aspect of dance wellness, offering physical therapy, athletic training, and massage therapy to their students ("Dance Wellness Clinic," n.d.). This dance wellness curriculum intervention was notably distinct from other examples of dance wellness program implementation within a postsecondary context, as the focus was solely on the educational component.

As the focus of this research project involved building and enhancing participant understandings and applications of exercise science literacy and wellness/wellness practices, the educational component of dance wellness programming was most relevant and applicable within this context. Ideally, students should receive exposure and access to, as well as experience with, multiple methodologies of implementing a wellness program - education, screening processes, direct healthcare - but this is not possible

within every university-level dance context. Not all programs and departments have access to healthcare professionals or their services, or do not have the resources to implement such an involved dance wellness program. This research project demonstrated that integrating a dance wellness educational component within the university dance context is fruitful and worthwhile for the health and wellness of those involved. Further work should be done to implement screening processes and familiarity with healthcare resources in a tangible and accessible manner to ensure that students receive experience with the multiple avenues of support that a wellness program can offer.

Limitations

A limitation of this study was the environment in which learning took place. With the COVID-19 pandemic underway during the course of this research study, all class meetings occurred online via Zoom. As noted previously, Gravenhorst's (2007) highlighted the preference of visual and active learning styles of university-level dance students. While this experimental curriculum did include a blend of visual, verbal, and active methods of instruction and content exploration, the virtual nature of online instruction combined with an emphasis on a lecture-based method of content delivery, this experimental course primarily centered on visual/verbal methods of instruction, with active learning serving a supplemental purpose. Further, another limitation of this study was the sample size. Because students self-enrolled in this course, the ultimate sample size (N=7) was random and non-controlled. A larger study with a greater sample size could potentially provide generalizability of the results to the larger university dance population.

Negative Incidences

One participant in particular, Justin, could serve as evidence against the effectiveness of this research study. As this course was open to any student at ASU, and as students could self-enroll in the course, Justin was the only participant with no prior fitness or dance background. As a Biology student, it was clear that Justin has a passion for the body and how it functions, however, his experience in the course appeared less fruitful, as he engaged significantly less than the other participants due to his lack of experience with the content. Most notably, Justin chose to not complete the Final Blueprint Project, including the Comparative Reflection and Analysis, meaning that his perspective was not as prevalent when solidifying the overarching themes with the qualitative data.

Conclusion

This research study showed that integrating an educational component of a dance wellness program into a university-level dance setting improved participants' exercise science literacy, understandings of wellness, and methods of instruction. By addressing the intellectual, physical, and occupational aspects of wellness, this experimental curriculum helped students to understand and apply exercise science, wellness, and instructional content within their own approaches to teaching and training. Further, this study provides initial evidence that integrating aspects of a wellness program (an educational component) into a university-level dance curriculum provides students with the knowledge, skills, and experience with concepts, approaches, and practices to enhance both their personal and professional capacities.

EPILOGUE

As a dance educator, I have always highly valued the technical, creative, and performance capacities of dance, as well as the intellectual and emotional wellness of those that I teach. However, my increased knowledge and experience in exercise science and fitness began to reframe how I approach my training - both in dance and fitness - and eventually began to reframe my approaches to teaching. I have learned, through my trials with my personal physical health and training, that there needs to be a balance between health and wellness to live a truly holistic, optimal, and sustainable life. I advocate that there is no better time to educate students on this balance than during adolescence and early adulthood. Through the course of planning, implementing, and evaluating this curriculum project, not only has my passion for health and wellness grown, but I have now experienced the incredible value of incorporating dance wellness pedagogy into the postsecondary dance context.

In the wake of completing this project, I see a deeper need for dance educators to integrate and advocate for the multidimensional aspects of wellness of each dancer within the classroom. I have noted, in retrospect, that while this project introduced students to the multidimensionality of wellness, the focus in content and classroom experiences teetered more toward the development of the intellectual, physical, and occupational dimensions of wellness. While focusing on these dimensions proved highly successful and significant, I would like to continue this line of research toward considering the relationship of the emotional, social, and spiritual dimensions of wellness within the university dance classroom. Eventually, I would like to arrive at an understanding of how all six dimensions of wellness can be seamlessly and holistically implemented into dance

curriculum to ensure the optimal development of dance students. Most importantly, my hope as a dance educator is to ensure that this educational experience could be accessible to any university dance program, regardless of degree focus or access to resources.

This project further illustrates the necessity for dance educators to remember that each individual within their classroom needs the knowledge, skills, and experience to not only have a successful career as a dance artist, but to live a successful life as a human being. These practices include balanced and safe training, informed and holistic approaches to teaching, positive coping and stress management skills, attainable goal-setting strategies, developing personal and professional values, and so much more. In focusing on the multidimensionality of health and wellness within the dance classroom, we, as dance educators, can holistically, optimally, and authentically prepare our students for true success upon graduation. As I leave my graduate education and my exceptional experience with the participants of this research project, I am left with gratitude and reverence. Most importantly, I am left with a drive to continue to investigate methods to integrate, as well as the impact of integrating, health and wellness frameworks within the dance educational experience at-large.

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APPENDIX A

PRE-TEST/POST-TEST CONTENT KNOWLEDGE ASSESSMENT

DCE 294: Dancer Fitness, Wellness, and Instruction Exercise Science and Fitness Instruction Content Exam

This content exam will test your knowledge on the areas needed to successfully pass the American Council on Exercise (ACE) Group Fitness Instructor (GFI) certification exam.

This content exam will test your knowledge on the following content areas:

- Group Fitness Class Considerations (12 questions)
- Anatomy, Kinesiology, and Training Concepts (19 questions)
- Monitoring and Feedback (9 questions)
- Learning and Teaching Styles (9 questions)
- Exercise Considerations and Participation Safety (12 questions)
- Nutrition (5 questions)
- Liability and Professionalism (8 questions)

A few notes before you begin this content exam:

- Please indicate your answers by bolding, highlighting, or coloring the text of the answer option that you've selected.
- **You MUST answer EVERY question. If you do not answer every question, you will not receive full points for this assessment.**
- You may take as long as you need to complete this content exam. Because this is a Word document, you can save your progress at any time and return back to the exam.
- You may need a calculator for the Nutrition section of this content exam.
- **Please DO NOT search for any answers online.** This content exam is designed to gauge your knowledge before and after taking DCE 294. Please answer each question to YOUR best ability. During the Post-Test, you may use any material collected during your participation in this course as you complete the exam.

Group Fitness Class Considerations

1. Which of the following statements describes a pre-planned group fitness class format?
 - a. Instructors individually create their class design by choosing their own music, cues, and movements
 - b. Instructors follow a set class design by following a written script that outlines the movements, music, and cues
 - c. Instructors don't have to worry about participants getting bored because each class is different and unique
 - d. Instructors make choices for their class design based on a longer list of provided options
2. The warm-up segment of a group fitness class is designed to achieve all of the following EXCEPT:
 - a. Takes the major muscle groups through their range of motion
 - b. Increase muscle flexibility

- c. Increase heart rate and internal body temperature
 - d. Prepares the body for the demands of the class
3. Which of the following is true of dynamic movement?
 - a. Dynamic movements take the body's joints through their natural range of motion
 - b. Dynamic movements involve static stretches that are held for 5-10 seconds
 - c. Dynamic movements will initiate the body's involuntary stretch reflex
 - d. Dynamic movements don't have to relate to the movements that will be performed in the conditioning segment of the class.
 4. The warm-up segment of your group fitness class should address which of the following considerations?
 - a. Is always 15-20 minutes in length
 - b. Incorporates joint mobility exercises and does not focus on joint stability
 - c. Incorporates rehearsal moves to prepare participants for the conditioning segment
 - d. Incorporates high-intensity exercise levels to prepare participants for the conditioning segment
 5. All of the following are considerations for planning the conditioning segment of your group fitness class EXCEPT:
 - a. The plan incorporates exercises that mimic the 5 primary movement patterns
 - b. The plan favors single joint over multi joint movements
 - c. The plan incorporates multiplanar training
 - d. The plan addresses the functional pairing of muscles in the body
 6. When planning an interval-based group fitness class, what exercise-to-recovery ratio should an ACE Certified Group Fitness Instructor aim for?
 - a. Between 2:1 and 2:2
 - b. Between 1:2 and 1:1
 - c. 2:1
 - d. 3:2
 7. Which of the following is NOT a consideration when planning the cool-down segment of your group fitness class?
 - a. Abruptly stopping intense exercise can cause the blood to pool in the lower body
 - b. Gradually decreasing intensity helps to remove metabolic waste from the muscles
 - c. Passive overstretching and ballistic stretching should be included
 - d. Including self-myofascial release can help to relieve tension and improve flexibility
 8. The post-conditioning cool-down segment of the group fitness class should include all of the following EXCEPT:
 - a. Static stretches should be performed for 15-30 seconds
 - b. At least 1 repetition of a static stretch for each major muscle group
 - c. Continual movement to keep the cardiorespiratory system slightly elevated
 - d. A change in the instructor's tone of voice and the use of less driving music

9. When would it NOT be appropriate for the music to be used in the background during a group fitness class?
 - a. When the movement doesn't necessarily need to match the beat
 - b. When trying to establish a specific mood or atmosphere in the class
 - c. When teaching a beginning step class
 - d. When teaching a yoga or aquatics class
10. What tempo of music should you select to teach a faster-paced movement class, such as kickboxing or some dance-based classes?
 - a. 100-120 beats per minute (bpm)
 - b. 120-130 bpm
 - c. 130-160 bpm
 - d. Higher than 160 bpm
11. What is the MOST appropriate response when faced with a lack of equipment while leading a group fitness class?
 - a. Give up your equipment so a participant can use it.
 - b. Change the set-up to a circuit-style format by arranging stations.
 - c. Notify the staff that there's a shortage of equipment.
 - d. Have participants look around the space for alternative pieces of equipment that they can use.
12. Which of the following is NOT one of the recommended methods to create progressions and regressions of movements?
 - a. Changing the intensity
 - b. Changing the length of the lever
 - c. Changing the movement
 - d. Changing the direction

Anatomy, Kinesiology and Training Concepts

1. Which muscle is a part of the hip flexor muscle group?
 - a. Rectus femoris
 - b. Semimembranosus
 - c. Gluteus minimus
 - d. Pectineus
2. Which muscle is NOT responsible for hip abduction?
 - a. Gluteus medius
 - b. Gluteus maximus
 - c. Vastus lateralis
 - d. Tensor fascia latae
3. Which muscle is NOT responsible for rotation and lateral flexion of the trunk?
 - a. Quadratus lumborum
 - b. Erector spinae
 - c. External oblique
 - d. Internal oblique
4. Which pair of opposing muscles are responsible for shoulder abduction and adduction?
 - a. Deltoids and latissimus dorsi

- b. Trapezius and rhomboids
 - c. Latissimus dorsi and rhomboids
 - d. Rhomboid major and rhomboid minor
5. What type of muscle contraction occurs when lifting the weight up during a bicep curl?
 - a. Concentric contraction
 - b. Eccentric contraction
 - c. Isometric contraction
 - d. Isotonic contraction
 6. What type of muscle contraction occurs when holding at the lowest point of your squat?
 - a. Concentric contraction
 - b. Eccentric contraction
 - c. Isometric contraction
 - d. Isotonic contraction
 7. All of the following are potential outcomes of imbalances between agonist and antagonist muscles EXCEPT:
 - a. Changes and deviations in posture can develop
 - b. Faulty/dysfunctional movement patterns can develop
 - c. Excessive stress is placed on the body's joints and structures
 - d. Joints remain able to move with equal efficiency in all directions
 8. Which of the following statements is NOT true of joints?
 - a. Joint stability and mobility are achieved by the structures of the joints and the neuromuscular system.
 - b. All joints demonstrate varying levels of stability and mobility.
 - c. Joints tend to favor mobility or stability based on their function within the body.
 - d. To protect the body, joints are either stable or mobile.
 9. The kinetic chain can be described as:
 - a. A movement sequence that includes movements that take place in all three planes of motion.
 - b. The way in which the 5 primary movement patterns are applied to an individual's activities of daily living.
 - c. Joints and body segments affect one another during movement.
 - d. The training principle of favoring integration over isolation, or training movements rather than solely training muscles.
 10. Which movement/exercise best described as occurring in the sagittal plane?
 - a. Bicep curl
 - b. Bicycle crunch
 - c. Arm circle
 - d. Side lunge
 11. Which movement/exercise best described as occurring in the frontal plane?
 - a. Bicep curl
 - b. Bicycle crunch
 - c. Arm circle

- d. Side lunge
12. Which movement/exercise best described as occurring in the transverse plane?
- a. Bicep curl
 - b. Bicycle crunch
 - c. Arm circle
 - d. Side lunge
13. Which movement/exercise best described as occurring in more than one plane of motion (circumduction)?
- a. Bicep curl
 - b. Bicycle crunch
 - c. Arm circle
 - d. Side lunge
14. Which of the following is a health-related component of physical fitness?
- a. Balance
 - b. Power
 - c. Flexibility
 - d. Coordination
15. Which of the following is a skill-related component of physical fitness?
- a. Muscular strength
 - b. Body composition
 - c. Muscular endurance
 - d. Reaction time
16. The training principle of overload can be described as:
- a. Exercise capacity can diminish relatively rapidly, and improvements gained through training are lost within a few months of stopping physical activity.
 - b. The physiological changes that are caused by training are highly specific to the types of activities that are performed.
 - c. A physiological system placed under above-normal stress will respond by increasing in strength or function.
 - d. There is a clear relationship between the intensity of exercise and exercise duration.
17. Which of the following is an example of how tempo can affect overload?
- a. Performing a bicep curl with a 1-count concentric movement and a 3-count eccentric movement
 - b. Performing a bicep curl with even 2-count concentric and eccentric movements
 - c. Performing a push-up in 3-counts instead of 4-counts
 - d. Matching the transitions between your movements to the phrasing of your music
18. When a person exercises at a hard intensity for a few minutes, which energy system is working to produce adenosine triphosphate (ATP)?
- a. The phosphagen system
 - b. The aerobic system
 - c. The glycolytic anaerobic system

- d. The kinetic system
19. Which of the following energy systems does NOT require oxygen to produce ATP?
- a. The phosphagen system
 - b. The aerobic system
 - c. The glycolytic anaerobic system
 - d. The kinetic system

Monitoring and Feedback

1. While teaching a Group Strength class, you notice that a new participant to the class is struggling to maintain their form while completing lateral raises with their dumbbells. What would be the MOST appropriate recommendation in this scenario?
 - a. Suggest they try the exercise without their weights
 - b. Have them decrease their lever length by offering for them to keep their elbows bent
 - c. Suggest that they stop exercising and rest for 1-2 minutes
 - d. Have them stagger their stance to increase their base of support
2. While observing your Pilates group fitness class, you notice that several participants are struggling to maintain proper form in their forearm plank. What would be the most appropriate regression to offer?
 - a. Raise up into a high plank on their hands
 - b. Open up into a side plank
 - c. Lowering down to their knees
 - d. Stopping and taking a rest
3. While performing squats during your Group Strength class, you notice that several of your participants are performing their squats by moving their knees forward. What cue would be the MOST appropriate to offer to the class in this scenario?
 - a. "Keep your chest open and your gaze lifted"
 - b. "Focus on hinging at the hips and lowering your glutes"
 - c. "Avoid hyper-flexing your knees"
 - d. "Inhale as you lower into your squat and exhale as you lift up"
4. How might an ACE Certified Group Fitness Instructor implement the Talk Test while teaching a Group Strength class?
 - a. Ask participants to talk with the person next to them about the difficulty of the previous exercise
 - b. Ask participants yes or no questions throughout the hardest segment of the class
 - c. Ask participants to rate their exercise exertion on a scale from 1-4
 - d. Ask participants to rate their exercise exertion on a scale from 1-10
5. Half-way through your Indoor Cycling group fitness class, you ask the class "How is everyone doing?" Most participants respond with 2-3-word answers, such as "I'm doing great!" or "Let's keep going!" Which of the ventilatory threshold(s) (VT) is the class likely experiencing?

- a. VT 1
 - b. Between VT 1 and VT 2
 - c. VT 2
 - d. Between VT 2 and VT 3
6. How might an ACE Certified Group Fitness Instructor build rapport while also offering feedback while teaching a group fitness class?
 - a. Give generalized positive feedback to the entire class
 - b. Recognizing individuals when giving positive feedback by using their names during class
 - c. Only offer individualized feedback and praise after the class has ended
 - d. Rely primarily on nonverbal cues, like facial expressions, eye contact, and body language, when offering positive feedback.
 7. Self-efficacy can be described as all of the following EXCEPT:
 - a. Self-efficacy is the belief in one's own capabilities to successfully execute necessary courses of action.
 - b. Self-efficacy can be reinforced through both extrinsic and intrinsic motivation.
 - c. Self-efficacy is the number of pros and cons an individual perceives regarding adopting and/or maintaining an activity program.
 - d. Self-efficacy is both a determinant of behavior and an outcome of behavior change.
 8. How might an ACE Certified Group Fitness Instructor help an individual build intrinsic motivation?
 - a. By offering opportunities to experience movement success by incorporating progressions, regressions, and teaching strategies
 - b. By creating a "fitness challenge" that involves a prize of a month of free classes
 - c. By using upbeat and driving music in every group fitness class
 - d. By offering praise and positive feedback as frequently as possible
 9. Of the following example goals, which goal adheres to the SMART goal guidelines?
 - a. "I will lose 10% of my bodyweight in order to improve my appearance and self-confidence"
 - b. "I will start going to the gym on a more consistent basis"
 - c. "Today, I will begin to increase my exercise intensity"
 - d. "I will lose 20 pounds in the next 4 months at a reasonable rate of 1-2 pounds per week"

Learning/Teaching Styles

1. By describing where and how a sensation should be felt within your cueing to help participants understand the desired movement, what learning does this practice relate to?

- a. Kinesthetic learning style
 - b. Active learning style
 - c. Verbal learning style
 - d. Visual learning style
2. An instructor provides their participants with a task, such as performing as many push-ups as possible during a 1-minute round within a HIIT class, while also supporting participants through one-on-one feedback. Which style of teaching does this best describe?
 - a. Command style of teaching
 - b. Leadership style of teaching
 - c. Practice style of teaching
 - d. Self-check style of teaching
 3. Which of the following is an example of an ACE Certified Group Fitness Instructor considering the psychomotor domain of learning when leading a group fitness class?
 - a. Incorporating the fundamental movements within the class that their participants will need to master in order to succeed with a new skill.
 - b. Encouraging participants to count out loud with you when learning new choreography.
 - c. Offering positive feedback and encouragement periodically to build participant rapport and morale.
 - d. Always changing up the choreography to ensure participant's never get bored within the class.
 4. You are teaching the participants in a dance-based group fitness class a grapevine and notice that most of them struggle with the skill (direction and/or coordination). What stage of learning are these participants likely in?
 - a. Associative stage of learning
 - b. Autonomous stage of learning
 - c. Novice stage of learning
 - d. Cognitive stage of learning
 5. In your small group yoga flow class, you notice that most of the participants are able to detect their own alignment errors in their downward facing dog pose. What stage of learning are these participants likely in?
 - a. Associative stage of learning
 - b. Autonomous stage of learning
 - c. Novice stage of learning
 - d. Cognitive stage of learning
 6. You decide to teach an integrated overhead press and squat during your Group Strength class. First, you teach the squat, ensuring that the majority of the participants have mastered this skill, before adding in the overhead press. What teaching strategy does this method describe?
 - a. Repetition-reduction
 - b. Part-to-whole/Add-in
 - c. Slow-to-fast/Half-time
 - d. Simple-to-complex/Layering

7. While planning your kickboxing class, one of your movement sequences involves a transition from a back kick with your right leg to an uppercut with your left arm. How would you classify this movement transition?
 - a. Matching transition
 - b. Mending transition
 - c. Patching transition
 - d. Method transition
8. While planning your Group Strength class, one of your movement sequences involves a squat with an overhead press in unison. How would you classify this movement transition?
 - a. Matching transition
 - b. Mending transition
 - c. Patching transition
 - d. Method transition
9. Which of the strategies for class education does the following statement represent? “If you work at a desk, this yoga pose can be performed while sitting in a chair as well.”
 - a. Performance
 - b. Health benefits
 - c. Form, function, and fit
 - d. Exercise adherence

Exercise Considerations and Participant Safety

1. You enter into the room to prepare to teach your Advanced Step group fitness class and find that the lights will not turn on. What is the MOST appropriate action an ACE Certified Group Fitness Instructor should take?
 - a. Notify the staff and wait for the lights to be fixed before you begin to teach.
 - b. Proceed with teaching your class, incorporating the dark room into your class theme.
 - c. Offer the participants to teach a different class format that is not as heavily based in movement.
 - d. Cancel your class due to the technical difficulties.
2. At the start of your yoga class, a new participant approaches you and says that they have a pre-existing injury to their left hamstring that significantly decreases their flexibility on that side of their body. As an ACE Certified Group Fitness Instructor, what would be the most appropriate response?
 - a. Suggest that they focus on their breathing throughout the class by inhaling through the nose and exhaling through the mouth
 - b. Suggest that they use yoga blocks and stretch straps and remind them to limit their range of motion with flexibility-centered poses
 - c. Suggest that they practice yoga 6-7 days a week to help their body adjust and address the muscle imbalance.
 - d. Suggest that they only complete flexibility-centered poses on their right side to avoid aggravating their injury.

3. Which of the following is NOT true of exercising in a hot climate?
 - a. If fluids lost from sweat are not replaced, blood volume will decrease
 - b. Vasoconstriction of the blood vessels causes the blood pressure to increase
 - c. Over time, the body will adapt to promote heat tolerance
 - d. External heat gained from the environment significantly adds to the body's total heat load
4. Which of the following is a sign/symptom of heat exhaustion?
 - a. Hot, dry skin and a rapid, strong pulse
 - b. An extreme sensitivity to the cold
 - c. Cold, clammy skin and low blood pressure
 - d. Extreme thirst and a low-grade fever
5. Which of the following is NOT true of exercising in the cold?
 - a. Heat loss is not affected by the addition of wind
 - b. Wear several layers of cotton-based clothing
 - c. Remove layers of clothing as needed while exercising in a cold climate
 - d. Cold temperatures can cause an increase in blood pressure
6. During your HIIT class, you notice that one of your participants with asthma begins to show signs of difficulty breathing and chest tightness. Which of the following is NOT a recommended step to manage symptoms of asthma/asthma attacks?
 - a. Have the participant gradually decrease their exercise intensity as to not shock the pulmonary system further.
 - b. Have the participant rest and encourage diaphragmatic breathing.
 - c. Encourage them to hydrate by drinking slowly and have them avoid ingesting cold drinks.
 - d. Get medical help immediately if their fingertips or lips begin to turn blue.
7. Which of the following is an exercise consideration for participants with osteoarthritis?
 - a. Participants with osteoarthritis need a longer time to warm-up their bodies, but do not need to cool-down.
 - b. Participants should avoid all physical activity and exercise and should limit their movement as much as possible during flare-ups.
 - c. Water temperatures for aquatic classes should be between 83 and 88° F.
 - d. Gentle static stretching is the preferred method for flexibility training for participants with osteoarthritis.
8. After several years of teaching, you begin to experience a disinterest in exercise, a disinterest in teaching classes, and a lack of motivation. What phenomenon are you likely experiencing?
 - a. Overtraining
 - b. Instructor burnout
 - c. Undertraining
 - d. Motivation fallout
9. What medical emergency is characterized by the following signs and symptoms? Shock; blurred vision, sensitivity to light; sleep disturbances; amnesia.
 - a. Concussion

- b. Heat exhaustion
 - c. Seizure
 - d. Heat stroke
10. What musculoskeletal injury is described as a tearing or overstretching of a muscle or tendon?
- a. Sprain
 - b. Strain
 - c. Fracture
 - d. Contusion
11. Which of the following is NOT a clear sign or symptom of exercise dependence?
- a. Only participating in 1 mode of exercise
 - b. Hair loss and dry skin
 - c. Extreme guilt for missing a workout
 - d. Weight loss in a very short period of time
12. Ice is recommended for acute injuries in the following forms, EXCEPT:
- a. In intervals of 10 minutes on and 10 minutes off
 - b. For 40 continuous minutes every 2 hours
 - c. To manage a soft-tissue injury
 - d. For 24-72 hours following the acute injury

Nutrition

1. Which of the following statements goes beyond the Scope of Practice for how an ACE Certified Group Fitness Instructor can use the Dietary Guidelines to advise their clients/participants on nutrition and nutritional choices?
- a. Offering suggestions and nutritional information about healthy post-workout snacks
 - b. Offering an overview of healthy eating patterns, including average daily food group intake
 - c. Offering information in determining individual calorie and nutrient needs
 - d. Offering recommendations of protein powder and other supplements to take
2. What are the recommended macronutrient proportions that the average adult should aim to consume?
- a. 45-65% carbohydrates, 20-35% proteins, 10-35% fats
 - b. 45-65% proteins, 20-35% carbohydrates, 10-35% fats
 - c. 45-65% carbohydrates, 20-35% fats, 10-35% proteins
 - d. 45-65% fats, 20-35% carbohydrates, 10-35% protein
3. While grabbing a handful of trail mix after your workout, you glance at the food label and see that 1 handful (approximately 3 tablespoons) of trail mix has the following nutritional values: 150 calories per serving, 10 grams of carbohydrate per serving, 5 grams of protein per serving, and 10 grams of fat per serving. How many calories from carbohydrate, protein, and fat will you receive for 1 serving of trail mix?

**Note that 1 gram of carbohydrate = 4 calories, 1 gram of protein = 4 calories, 1 gram of fat = 9 calories*

- a. 40 calories from carbohydrates, 40 calories from protein, 70 calories from fat
 - b. 40 calories from carbohydrates, 20 calories from protein, 90 calories from fat
 - c. 60 calories from carbohydrates, 30 calories from protein, 60 calories from fat
 - d. 65 calories from carbohydrates, 20 calories from protein, 65 calories from fat
4. Using the same values from the question above, what are the approximate macronutrient proportions for 1 serving of trail mix?
 - a. 27% carbohydrates, 27% protein, 46% fat
 - b. 43% carbohydrates, 14% protein, 43% fat
 - c. 40% carbohydrates, 20% protein, 40% fat
 - d. 27% carbohydrates, 13% protein, 60% fat
 5. Which of the following is NOT true of fluid intake before, during, and after exercise?
 - a. A 2:1 fluid replacement to fluid loss ratio should be used during exercise.
 - b. Individuals should pre-hydrate by consuming 17-20 ounces of water 2 hours before exercise.
 - c. Consuming electrolytes following physical activity/exercise can help to speed-up the body's rehydration process.
 - d. It's recommended that every 10-12 minutes during exercise, individuals should aim to drink 7-10 ounces of water.

Liability and Professionalism

1. When reporting equipment damage and/or malfunction, which of the following is the MOST appropriate course of action?
 - a. Notify the participants about the damaged/malfunctioning equipment and advise them to use it at their own risk.
 - b. Place a clearly visible sign on the damaged/malfunctioning equipment.
 - c. Immediately remove the damaged/malfunctioning equipment from the space and notify the appropriate staff member(s).
 - d. Use the damaged/malfunctioning equipment yourself so the participants do not have to.
2. Which of the following is NOT a reason that allegations of facility negligence could arise due to oversight/poor behavior on your behalf?
 - a. Failure to remove damaged or malfunctioning equipment from the room before the class begins
 - b. Failure to provide appropriate instruction and adequate supervision
 - c. Playing copyrighted music during your class without receiving permission
 - d. Setting participants up too close together with inadequate space around the equipment
3. What statement is true of an ACE Certified Group Fitness Instructor securing professional liability insurance?

- a. Professional liability insurance is specifically designed to cover personal injuries that occur as a result of an exercise session.
 - b. All professional liability insurance policies are the same and will cover work within the health and fitness industry.
 - c. An ACE Certified Group Fitness Instructor does not need liability coverage higher than \$500,000.
 - d. The professional liability insurance policy will cover any type of group fitness class, including classes held outside.
4. Of the following statements, which is true of the ACE Certified Group Fitness Instructor's responsibility with copyright law?
- a. Using commercial music for exercise purposes does not violate copyright law.
 - b. A for-profit exercise class is considered a public performance and use of commercial music in this setting would violate copyright law.
 - c. If an instructor obtains a performance license, they can use any commercial music they want in their classes.
 - d. Professional liability insurance will cover an instructor for copyright infringement claims.
5. Which of the following is true of holding group fitness classes in public settings?
- a. Any public space (beaches, parks, trails, etc.) are free for any use, including holding non-profit and for-profit group fitness classes.
 - b. The instructor's professional liability insurance policy will cover teaching group fitness classes in outdoor spaces.
 - c. There are no potential dangers of holding a group fitness class outside in a public space.
 - d. There are local laws that describe the scope of use of public spaces (beaches, parks, trails, etc.).
6. A participant in your indoor cycling class reports that they've been experiencing knee pain since beginning indoor cycling classes. What would be the MOST appropriate response according to the ACE Code of Ethics?
- a. Recommending that they take ibuprofen to help with the pain
 - b. Refer them to a different exercise modality
 - c. Recommend stretches that target their quadriceps and calf muscles
 - d. Refer them to an appropriately qualified healthcare professional
7. Which of the following is NOT true of the Allied Healthcare Continuum?
- a. Physicians and nurse practitioners are the "gatekeepers" of the Allied Healthcare Continuum
 - b. Group Fitness Instructors, health coaches, and personal trainers fall under the "alternative healthcare" branch of the Allied Healthcare Continuum
 - c. All professionals within the Allied Healthcare Continuum are credentialed.
 - d. The purpose of the Allied Healthcare Continuum is to provide services to identify, prevent, and treat diseases and disorders.
8. When must an individual agree to uphold the ACE Code of Ethics?
- a. Once they sign up to take their certification exam

- b. Once they pass their certification exam
- c. Once they get hired to teach group fitness classes
- d. Once they begin teaching group fitness classes

APPENDIX B
FINAL BLUEPRINT PROJECT

This Final Blueprint Project consists of 3 parts:

Part 1: GF Class Blueprint #1 Project (10 points)

You will submit your Group Fitness Class Blueprint #1 project, consisting of your class blueprint, and your videos of you teaching your group fitness class. You may choose to submit your project as-is (from your previous submission) or make some changes/modifications based on the feedback received from your instructor and/or your evaluation partner.

Part 2: Dance Class Blueprint Project (60 points)

You will submit your Dance Class Blueprint Project (blueprint #2), consisting of your final draft class blueprint (30 points), and your videos of you teaching your dance class (30 points). If you wish, you may choose to create a 2nd fitness class if you'd prefer to focus on refining your knowledge of exercise science concepts for this project. However, it's strongly encouraged for you to create a dance class blueprint to apply your knowledge to a different context.

Part 3: Blueprint Comparative Analysis and Reflection (30 points)

You will respond to the prompts/questions on the attached document titled Comparative Analysis and Reflection (Appendix D). Your responses should be in full, complete, well-formed sentences, written at a college level, and free of grammatical and spelling errors. Each prompt/question should have a **minimum of 2 sentences** of response, should connect back to concepts and information learned throughout the semester, and should indicate a high level of reflection on and application of that knowledge.

APPENDIX C
COMPARATIVE ANALYSIS AND REFLECTION

Final Blueprint Project
Part 3: Blueprint Comparative Analysis and Reflection

You will respond to each of the below prompts/questions with a *minimum of 2 sentences*. Your responses should be full, complete, and well-formed sentences, should be written at a college level, and should be free of grammatical and spelling errors. In addition, your responses should connect back to concepts and information learned throughout the semester and should indicate a high level of reflection on and application of that knowledge.

1. What were your strengths in designing and leading your Group Fitness (GF) Class Blueprint #1?
2. What were your weaknesses in designing and leading your GF Class Blueprint #1?
3. What were your strengths in designing and leading your Dance Class Blueprint?
4. What were your weaknesses in designing and leading your Dance Class Blueprint?
5. What elements of designing and leading your 2 class blueprints were the same?
6. What elements of designing and leading your 2 class blueprints were different?
7. How would you describe the relationship between fitness/exercise science concepts and dance technique?
8. As a dancer and/or teacher, why is it important for you to understand and apply fitness/exercise science concepts?
9. In what ways will you apply the knowledge you've gained from this class (wellness, fitness concepts, anatomy, exercise science) within your own personal training?
10. In what ways will you apply the knowledge you've gained from this class (wellness, fitness concepts, anatomy, exercise science) within your own teaching?

APPENDIX D

WELLNESS JOURNAL ENTRIES

Respond to each of the following questions **fully, thoughtfully, and critically**. There is no required length for this response, **HOWEVER**, your response should be written at a college-level, meaning that it is free of grammatical/spelling errors. Further, your response should indicate your understanding of the content and concepts covered in class.

Reflect back on the exercise programming and in-class teaching experiences we've had thus far (the exercise progressions/regressions, balanced conditioning plan, Group Fitness Class Blueprint #1, and transitions/teaching strategies activities), then respond to the following questions.

1. What are your strengths in planning group fitness classes?
2. What do you need to further refine and develop as you continue to plan group fitness classes?
3. What specific aspects of teaching do you feel you excel at as a group fitness instructor?
4. What specific aspects of teaching do you feel you need to further refine and develop as a group fitness instructor?
5. Do you think there is a relationship between fitness/exercise science concepts and dance technique? Why or why not?
6. As a dancer and/or teacher, why is it important for you to understand and apply fitness/exercise science knowledge and concepts?