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Abstract

Technology and health are interrelated, along with the development of technology accompanied by increasing health demands due to the COVID-19 pandemic. Therefore, this study aims to rethink the use of technology in exercising to maintain health. The focus of the study in this research is the relationship between the use of technology and health through COVID-19 healthy gymnastics. The method used in this research is to use a cross-sectional survey online. This method is used because the survey can be done anytime and anywhere, which can be more practical. The data collection instrument used is an online survey using the Google form application. This application is suitable for use in a practical and effective data collection process. Then to measure and find out the results of the data collected, the researcher used the Statistical Package for the Social Sciences (SPSS) software with a bivariate correlation coefficient test. The subjects of this study were UPI students who contracted physical education courses and sport. The results of this study indicate that there is a very high relationship between technology and health through COVID-19 healthy gymnastics. This study concluded that students who would be aware of their health by doing sports optimize the use of technology to support their sports activities.

Introduction

The current coronavirus or COVID-19 pandemic is a very dangerous epidemic and detrimental to all aspects of the past century. This coronavirus was first detected in the city of Wuhan, China. At first, it was believed that the COVID-19 virus came from wild animals sold in Wuhan. With the acceleration of the spread of the COVID-19 virus, countries worldwide are also getting the impact, including Indonesia. Various efforts have been made to handle the spread of the COVID-19 virus, including the lockdown policy and Large-Scale Social Restrictions.

In their daily activities, humans are very dependent on health (Malinauskiene et al., 2011). Of course, if humans are not in good health, their daily activities will not be able to be carried out (Liston et al., 2014) because the human body that is required to carry out these activities cannot support to carry out an activity (Paloma et al.,

2013). Therefore, it is essential to have a health condition to support daily activities in doing activities (Kirkpatrick et al., 2017). Health itself must be maintained in several ways, like exercising (Garland et al., 2011). Sport is a critical aspect of every human's health (Cipora et al., 2016); by exercising, humans will be able to improve their health to be fit (above healthy) (Credeur et al., 2016). In this era, especially the 4.0 industrial revolution, health, and sports are strongly supported by technology (Chen & Chan, 2014). Technology makes it easy for everyone to do activities, one of which is exercising to maintain one's health (Marburger, 2011).

Typically, technology refers to tools and equipment ranging from hammers and simple nails to sophisticated computers, airplanes, and spacecraft (Madan, 2009). Technology is understood as an artificial tool to achieve human interests and goals (Medina, 2015). This understanding seems to be the one that underlies most of the discussion in sports (Hussain & Rutter, 2012). Thus, technology in sport is also a manufactured tool to achieve human interests and goals related to sports (Buns & Thomas, 2011).

Technology serves many functions in sports (ITRS ERD Working Group, 2011). One of them has the function of building a system in sports (Jung et al., 2009). Examples such as without balls and sticks, no baseball, without bicycles, bicycle racing are not possible. Technology might improve appearances, such as the new Fastskin swimsuit, which is said to reduce water friction, or new alpine ski carvings that seem to help beginners master the basic techniques of sports more easily (Loland, 2002).

Other types of technology, such as helmets and body armor in boxing and ice hockey, should prevent injury (Loland, 2012). The possibility of using a video camera in refereeing a soccer match is considered to increase justice (Winand & Fergusson, 2018). So it is not surprising that the sports community is regularly involved in controversies regarding the development, implementation, and use of technology (Loland, 2012).

In the world of sports, much technology has been used. So far, it is more dominant in achievement sports in its technology (Filipp, 2007). Nevertheless, over time, technology has also penetrated the field of health sports (Caine et al., 2012). As evidenced by the many sports applications, maintaining much health is very practical, and they can be directly installed on everyone's smartphone (Lohan, 1998). The emergence of many of these applications shows that many people are aware of the importance of sports to maintain health (Casey et al., 2017), which is undoubtedly supported by several applications provided by the technology services to support everyone to exercise appropriately and correctly per everyone's needs (Nigg, 2003).

The Importance of Sports for Health through Healthy Gymnastic COVID-19

Keep away from Various Diseases

The first benefit of exercise is to increase endurance, so it is not susceptible to disease. When exercising, the body will be freer to move. This situation will trigger the process of metabolism and blood circulation to become smoother. The result is a healthier and stronger body and not easily attacked by diseases (Church & Blair, 2009).

Make the Body more Robust

Movements made during exercise stimulate all parts of the body to be more flexible. The muscles of the body also become more elastic and not stiff. For children, sports are essential to support their posture. Since childhood, children who regularly exercise will have a sturdy posture and not bend when walking (Garcia-Falgueras, 2016).

Stimulates Ideal Growth

When the body is used for the activity, the calories in it will burn more completely. These calories will be processed into energy as a whole without anything left and potentially cause a pile of body fat. The body gets an adequate supply of nutrients to launch an ideal process of growth and development (Howell & Kones, 2017).

Improve Thinking Power

In addition to physical benefits for the body, regular exercise also has an excellent role in improving children's thinking. The fruit of physical activity carried out routinely makes the brain more fulfilled its nutritional intake. The brain develops periodically and makes children smarter when the learning process arrives (Galvão, 2018).

The Urgency of Technology in Sports to Support Health through Healthy Gymnastic COVID-19

In an age that is demanded to be fast and practical, we must adapt quickly (Henry, 2015). One way is to use existing technology. The development of technological capability is one of the dominant factors for any country to develop the nation's intellectual life, increase the prosperity of the people, and protect the interests and sovereignty of the country. Moreover, with the rate of technological development that continues to increase with the increasingly high speed (Siegel et al., 2014), there is no other choice for each country except to make every effort to follow and use it as well as possible. Technology is an inseparable thing from daily life in modern times like today (Shonin & Van Gordon, 2015). In almost every field, technology has a significant role in supporting progress and development, not least in sports (Tyagi et al., 2013).

Technology has an essential role in helping progress sports achievement (Tyagi et al., 2013). Countries that involve technology in sports exercises tend to have more advanced achievements (Sull, 2015); this can happen because high-tech tools have higher accuracy than manual tools. Awareness of the importance of technology in the world of sports has also been realized seriously by several countries by establishing various universities that are accompanied by the Sports Science laboratory such as JISS (Japan Institute of Sport Science) in Japan, KISS (Korea Institute of Sport Science) in Korea and others. Unfortunately, the involvement of technology in sports is not yet entirely acceptable in all countries. In reality, sophisticated technology tools have low prices, especially for countries with consumer positions such as, for example, Indonesia, which mainly uses foreign products.

Achievement in sports is indeed significant for a country to make the country good (Gold & Gold, 2012).

However, it is his achievements as an indicator of the country's success in sports and the level of public health, which is assisted with sports instruments (Downward et al., 2016), because the sport has become a culture in the community. If sport has become a culture, of course, the community will indirectly be maintained health. On the other hand, at this time, technology in sports does not only focus on the field of achievement (Jordaan & Van der Merwe, 2015) but has penetrated sports health intending to support the health level of everyone by exercising.

The spread of technology in sports health will be an outstanding breakthrough so that everyone can be more practical to maintain their health by exercising (Esco, 2013). Several applications integrated with smartphones have been circulating a lot; one of them is like an application that can count calories burned, count footsteps, and then arrange exercise training with the aim of conditioning to pursue an increase in one's fitness level.

Method

This study uses a quantitative approach with a cross-sectional survey method (online survey), which aims to determine how much people's awareness of health using technology has been developed a lot (Fraenkel & Wallen, 1993). This study focuses on the relationship between technology and health through COVID-19 healthy exercise as an online sports medium for UPI students, which students use to maintain their health by exercising. The sample used is students who contract Physical Education and Sports courses in one lecturer, which means that the number of samples to be studied is 40. The data collection technique used was observation using an online survey instrument (Google form). Then, the data were analyzed, and conclusions were drawn, then discussed in detail and clearly according to what was happening in the field (Fraenkel & Wallen, 1993).

Results

If the significance value is more significant than 0.05, then the data is normally distributed, but if the significance value is less than 0.05, the data is not normally distributed. On the results of trial data and after being tested using one-sample Kolmogorov Smirnov has a significance value of 0.083 on the use of technology and of 0.200 at a level of health awareness greater than 0.05, the data is normally distributed. The results are given in Table 1.

Table 1. Normality Test Result

One sample Kolmogorov Smirnov Test	Sig.	Note	Conclusion
Technology	0.083	Ho accepted	Normal data
Health	0.200	Ho accepted	Normal data

The analysis continues with the correlation test to calculate the correlation coefficient between the two variables (technology and health) using the bivariate correlation coefficient (see Table 2).

Table 2. Correlation Test Result

Coefficient Correlation bivariate	Pearson correlation	Sig.	Decision
	0.861	0.000	Ho rejected

Statistical hypothesis validation criteria

H₀: There is no relationship between technology and health through COVID-19 healthy exercise as an online sports medium for UPI students

H₁: There is a relationship between technology and health through COVID-19 healthy exercise as an online sports medium for UPI students

Decision-making:

- If the Sig (p) value <0.05, then Ho is rejected = H₁ is accepted
- If the Sig (p) value > 0.05, then Ho is accepted = H₁ is rejected

Analysis of the correlation test stated Pearson correlation = 0.861, p = 0.000 <0.05, then Ho is rejected. There is a relationship between technology and health through COVID-19 healthy exercise as an online sports medium for UPI students (see Table 3).

Table 3. Table of Coefficient Correlation

Correlation	Relationship level
0 – 0.19	Very Low
0.2 - 0.39	Low
0.4 - 0.59	Middle
0.6 - 0.79	High
0.8 - 1	Very High

The correlation test results show that a Pearson correlation of 0.861 can be interpreted that the relationship between the two variables has a very high level of relationship because the value of 0.861 is between 0.8-1.

Discussion

Participating in sports is known to help individuals maintain weight, bone and muscle strength, and mental health while reducing the risk of cardiovascular disease, type 2 diabetes, metabolic syndrome, and various forms of cancer (Elsawy & Higgins, 2010). Although exercise is very important at all ages, research supports that college/university students are a critical point because exercise activity levels tend to decline during the adolescent-to-adult transition (American College Health Association, 2018; Bray & Born, 2004; Bray & Kwan, 2006). Technology can be an effective tool in assisting students in achieving health goals through a combination of reducing calorie intake, monitoring exercise levels, and helping to measure health-related behaviors (Althoff et al., 2017; Fanning et al., 2012). The advantage of using technology integration is that it provides live tracking

responses for users to view (Ball et al., 2015; Bice et al., 2016). Feedback from technology is very important because it is related to achieving activity goals (Ball et al., 2015). Such feedback will certainly be very beneficial during the current COVID-19 pandemic, which requires limiting in-person social gatherings (Carter, Akerson, & Cesljarev, 2021; Jackowicz, 2021; Maani, 2020; Shirotriya, 2021).

Technology currently has very practical benefits for everyone in any field, especially in sports itself, and it is no surprise that many people use mobile apps, wearable activity trackers, and smartwatches to help monitor and help improve exercise activity. The impact of wearable technology and computer-based tracking systems is beginning to show similar results to face-to-face weight control programs (Lyons et al., 2014; Polzien et al., 2007). These similarities suggest that technology closes the loop for full integration into society.

Technology is needed to achieve the best results accurately in order to minimize human errors that often occur. Looking at the findings in the form of quantitative data, it is very clear that the relationship between technology and health through COVID-19 healthy exercise as an online sports medium for UPI students is very important. Not only sports achievements that need a touch from technology to achieve the best performance, but health sports also really need support from technology to make it easier for everyone to exercise properly and properly to achieve the expected level of health to body fitness. Some of the benefits of technology in sports include:

1. Provide convenience in carrying out sports activities;
2. Make it easy to convey information;
3. Streamlining the process of achieving health sports goals;
4. Generating creative thinking patterns to produce the expected achievements in sports activities

The use of technology has a significant impact on sports activities. The type of technology device (smartphone or app) is not a problem, but using some type of technology app/device might make the individual more aware of their activities and time in exercise. These findings can help health promotion professionals implement programs to increase exercise, especially in college students (Bice et al., 2019). In the development of existing technology, sports activities are no longer strenuous. Various tools, from sweat-absorbing clothes to lightweight shoes, are ready to become supporting "weapons" in sports, especially with the emergence of many applications that can be used and installed directly on everyone's smartphone. The following are important things about the touch of technology through COVID-19 healthy exercise as an online sports medium for college students to achieve complete health:

1. Mastery of technology for everyone, especially the younger generation, is considered very important because as the next generation, we are required to master technology to solve technological development problems in Indonesia, especially in the field of sports;
2. By paying attention to the development and progress of the times, the use and control of the technology are necessary to achieve the nation's welfare. The technology vision and mission is formulated as a guide to optimizing every resource in the field of sports;
3. The pursuit of health level by exercising and of course the achievements of sports to achieve higher, higher, stronger, Fortius, cannot possibly be achieved optimally without involving the development of sports equipment technology. Likewise, the existence of media that can create an effective and

efficient influence is one of the roles of technology in supporting sports.

Technology is not limited to just wearables. Mobile phone applications have contributed to the surge in health assessments through exercise (Fanning et al., 2012). Various types of applications allow individuals to match health goals by exercising (Fanning et al., 2012). Recent years have increased mobile phone applications and internet-based interventions using social media platforms as an important part of today's technology that can integrate with sports applications, such as Facebook, Instagram, and Twitter, to share knowledge, provide support, and provide resources. For various types of sports activities (Medeiros et al., 2017). Through social networks and mobile applications, individuals may be intrinsically motivated to share their level of exercise activity across their social media platforms (Althoff et al., 2016; Maher et al., 2015). Followers on more physically active social media accounts can extrinsically motivate other individuals' social media peers to increase their exercise activity levels (Althoff et al., 2017; Vaterlaus et al., 2015).

Referring to the findings that students who use technology are significantly associated with more days of high-intensity exercise. The difference between moderate and high-intensity exercise can be difficult to monitor. Nevertheless, new technology devices are capable of recording and mapping activity intensity using the built-in heart rate monitor or connecting to a sensor-based heart rate monitor. The ability to track intensity allows the individual to adjust the activity to achieve a higher intensity and potentially makes it more likely to meet recommended values (Bice et al., 2019).

College students are the main group of young adults to focus on because that age is the time to build healthy habits. The current literature supports the idea that young individuals track exercise patterns, such as running, which may lead to the acquisition of habitual behavioral changes that can pass into adulthood (Dallinga et al., 2015). Furthermore, young adults who have used exercise applications on their mobile for health benefits are found to run more often, improve health and lifestyle perceptions, and improve self-image (Dallinga et al., 2015). Users of sports applications feel more energized, maintain exercise behavior, and motivate others to exercise (Dallinga et al., 2015). Exercise apps can be a great tool to help monitor behavior change and promote healthy behavior. Most health and fitness applications are used to increase knowledge and provide services for recording activities, rather than strengthening applications that allow interaction with other users and social media (West et al., 2012). The findings contribute to the current study's idea that college students benefit from exercise apps on mobile and devices that can be used to make health-promoting behaviors a habit.

Students may be more motivated to increase their level of sports activity by using technology tools and then sharing on their current social media. The influence of the level of sports activity is influenced not only by the use of technology and applications but also by sharing the results of sports activities with their peers on social media. Many researchers have studied the use of social media and exercise. However, in this study, the research focuses on the relationship between technology and sports, especially through healthy gymnastics COVID-19 as a sports technology medium during the COVID-19 pandemic in increasing individual sports activities. Students in the study of Althoff et al. (2016) shared their achievement of strong sports activity levels with their current peer group on social media and received positive rewards in return. Such achievement can increase individuals'

self-awareness about their health journey leading to better habits such as healthier eating and increased exercise activities to share with their peers and receive positive rewards. When students continue to share their sports activity level on social media, extrinsic motivation to stay physically active can increase due to peer expectations (Vaterlaus et al., 2015). Increased social media sharing can also intrinsically motivate students to participate in vigorous sporting activities to receive more rewards (Vaterlaus et al., 2015).

Looking at the implications for health, technology (social media and healthy gymnastics), and the level of exercise activity is a new perspective. Success for obese individuals to increase exercise time may not necessarily apply to those of normal weight in terms of technology integration. Individuals trying to lose weight may need an exercise program of the consecutive or increasing number of active days to create a sense of habit in creating a new active lifestyle and utilizing technology in different ways.

In the current review, technology-related survey data appear to serve as a link between educating participants and creating offline action to participate in sporting activities and engage in sports activities at high levels of intensity (Bice et al., 2019). Further research is needed to determine how and where individuals are motivated by applying wearable technology and activity tracking devices. After completing the current study, there are still questions about how students are motivated (intrinsically vs. extrinsically) or whether others can be motivated using theory to replicate the same application/social media sharing environment.

Given the increasing use of technology and new media, practitioners have shown an increasing interest in technology's role in service delivery, particularly sports. Despite this interest, there is a limited base of sports-specific knowledge for professionals to draw from that informs their practice when seeking to use media and technology in the provision of sports online (Price et al., 2020). Therefore, it provides other researchers with several future research opportunities to broaden the evidence base those practitioners can draw from when consulting online. In particular, future research should explore client and practitioner perceptions of the utility, ease of use, and effectiveness of technology in the online service delivery process. In addition, researchers must also try to understand the best way to measure the effectiveness of using technology and media in providing sports, especially healthy gymnastics COVID-19. Thus, these opportunities and considerations for using technology in online service delivery can be a solid foundation and can be leveraged to inform their practice.

Conclusion

From the survey results obtained from 40 samples, the results are quite diverse but still in the same frame, namely the majority use technology as a supporting aspect to maintain health by exercising through COVID-19 healthy exercise as an online sports medium for UPI students. Then, from the above data analysis results using the Statistical Package for the Social Sciences (SPSS) software, it was found that the data obtained was normally distributed, which means that the analysis using SPSS could be continued. After that, the data was tested using a correlation test which resulted in a relationship between technology and health through COVID-19 healthy exercise as an online sports media for UPI students. In addition, the data shows that there is a very high relationship between technology and health, which means that students who will be aware of their health

by doing sports optimize the use of technology to support their sports activities. With these findings, the use of technology in exercising to achieve the expected health level is very important.

This research relies on the use of technology related to sports carried out online. However, the limitation of this research is, of course, that the internet network is not always stable. Therefore, researchers recommend developing this technology and sport offline, but many people can still do it.

Notes

This research is a program in particular under the auspices of the Deputy for Strengthening Research and Development, who instructs to refocus research that has previously been submitted within three years. This research is done because researchers can contribute to global problems, namely the spread of the COVID-19 virus, especially in Indonesia.

References

- Hussain, A., & Rutter, P. (2012). Use of community pharmacies by young men: Perceptions, expectations and barrier. *International Journal of Pharmacy Practice*, 20, 52-53.
- Althoff, T., Jindal, P., & Leskovec, J. (2017). Online actions with offline impact: How online social networks influence online and offline user behavior. *WSDM 2017 - Proceedings of the 10th ACM International Conference on Web Search and Data Mining*. <https://doi.org/10.1145/3018661.3018672>
- Althoff, T., White, R. W., & Horvitz, E. (2016). Influence of pokémon go on physical activity: Study and implications. *Journal of Medical Internet Research*, 18(12), e315. <https://doi.org/10.2196/jmir.6759>
- American College Health Association. (2018). American College Health Association-National College Health Assessment II: Reference Group Executive Summary Fall 2010. *Hanover, MD: American College Health Association*.
- Ball, J. W., Bice, M. R., & Adkins, M. M. (2015). Qualitative Assessment of an Electronic Activity-Tracking Device: Strengths, Weaknesses, and Considerations in Behavior Change Interventions for Health Educators. *Health Educator*, 47(1), 20-26.
- Bice, M. R., Ball, J. W., Hollman, A., & Adkins, M. (2019). Health Technology Use: Implications for Physical Activity Behaviors Among College Students. *International Journal of Kinesiology in Higher Education*, 3(1), 23-34. <https://doi.org/10.1080/24711616.2018.1516524>
- Bice, M. R., Ball, J. W., & McClaran, S. (2016). Technology and physical activity motivation. *International Journal of Sport and Exercise Psychology*, 14(4), 295-304.
- Bray, S. R., & Born, H. A. (2004). Transition to University and Vigorous Physical Activity: Implications for Health and Psychological Well-Being. *Journal of American College Health*, 52(4), 181-188. <https://doi.org/10.3200/JACH.52.4.181-188>
- Bray, S. R., & Kwan, M. Y. W. (2006). Physical activity is associated with better health and psychological well-being during the transition to university life. *Journal of American College Health*, 55(2), 77-82. <https://doi.org/10.3200/JACH.55.2.77-82>

- Buns, M. T., & Thomas, K. T. (2011). Convergent validity between a sport video game and real sport performance. *Sports Technology*, 4(1-2), 77-87. <https://doi.org/10.1080/19346182.2012.691509>
- Caine, M., Blair, K., & Vasquez, M. (2012). Materials and technology in sport. *Nature Materials*, 11(8), 655-658. <https://doi.org/10.1038/nmat3382>
- Carter, I., Akerson, V., & Cesljarev, C. (2021). Reflections on teaching fully asynchronously: A self-study of elementary science and health methods during the COVID-19 pandemic. In V. L. Akerson & I. S. Carter (Eds.), *Science Education during the COVID-19 Pandemic: Tales from the Front Lines* (pp. 165-190). ISTES Organization.
- Casey, A., Goodyear, V. A., & Armour, K. M. (2017). Rethinking the relationship between pedagogy, technology and learning in health and physical education. *Sport, Education and Society*, 22(2), 288-304. <https://doi.org/10.1080/13573322.2016.1226792>
- Chen, K., & Chan, A. H. S. (2014). Gerontechnology acceptance by elderly Hong Kong Chinese: a senior technology acceptance model (STAM). *Ergonomics*, 57(5), 635-652. <https://doi.org/10.1080/00140139.2014.895855>
- Church, T. S., & Blair, S. N. (2009). When will we treat physical activity as a legitimate medical therapy... even though it does not come in a pill? *British Journal of Sports Medicine*, 43(2), 80-81.. <https://doi.org/10.1136/bjism.2008.053850>
- Credeur, D. P., Stoner, L., & Dolbow, D. R. (2016). Increasing physical activity in spinal cord injury: Upper-body exercise alone not enough? *Archives of Physical Medicine and Rehabilitation*, 97(1), 171. <https://doi.org/10.1016/j.apmr.2015.09.009>
- Dallinga, J. M., Mennes, M., Alpay, L., Bijwaard, H., & De La Faille-Deutekom, M. B. (2015). App use, physical activity and healthy lifestyle: a cross sectional study. *BMC Public Health*, 15(1), 1-9.. <https://doi.org/10.1186/s12889-015-2165-8>
- Downward, P., Dawson, P., & Mills, T. C. (2016). Sports participation as an investment in (subjective) health: A time series analysis of the life course. *Journal of Public Health*, 38(4), e504-e510. <https://doi.org/10.1093/pubmed/fdv164>
- Elsawy, B., & Higgins, K. E. (2010). Physical activity guidelines for older adults. *American family physician*, 81(1), 55-59.
- Cipora, E., Smoleń, E., Klimaszewska, A., Klimaszewska, E., & Zukow, W. (2016). Nutritional Behaviours Of Adolescents Living In Rural Areas. Part 1. Characteristics Of Health Behaviours Regarding Regular Consumption Of Meals And Level Of Acceptance Of Own Body Weight. *Journal of Education, Health and Sport*, 6(13), 317-333. <https://doi.org/10.5281/zenodo.438709>
- Esco, M. R. (2013). Resistance training for health and fitness. *Medicine ACoS, ed. American College of Sports Medicine. Indianapolis: American College of Sport Medicine*, 1-2.
- Fanning, J., Mullen, S. P., & McAuley, E. (2012). Increasing physical activity with mobile devices: A meta-analysis. *Journal of Medical Internet Research*, 14(6), e161. <https://doi.org/10.2196/jmir.2171>
- Filipp, F. (2007). Is science killing sport? Gene therapy and its possible abuse in doping. *EMBO Reports*, 8(5), 433-435. <https://doi.org/10.1038/sj.embor.7400968>
- Fraenkel, J. R., & Wallen, N. E. (1993). Methodology glossary-don't cite. *How to Design and Evaluate Research in Education*.

- Galvão, D. (2018). Exercise medicine across the cancer trajectory. *Journal of Science and Medicine in Sport*, 21, S73. <https://doi.org/10.1016/j.jsams.2018.09.166>
- Garcia-Falgueras, A. (2016). Hula hoop in fitness and the centripetal force. *Psychology*, 7(13), 1503. <https://doi.org/10.4236/psych.2016.713147>
- Garland, T., Schutz, H., Chappell, M. A., Keeney, B. K., Meek, T. H., Copes, L. E., Acosta, W., Drenowatz, C., Maciel, R. C., Van Dijk, G., Kotz, C. M., & Eisenmann, J. C. (2011). The biological control of voluntary exercise, spontaneous physical activity and daily energy expenditure in relation to obesity: Human and rodent perspectives. *Journal of Experimental Biology*, 214(2), 206-229. <https://doi.org/10.1242/jeb.048397>
- Gold, J. R., & Gold, M. M. (2012). Beijing-London-Rio de Janeiro: A never-ending global competition. In *Handbook of the London 2012 Olympic and Paralympic Games: Volume One: Making the Games* (pp. 305-318). Routledge. <https://doi.org/10.4324/9780203132517>
- Henry, A. (Ed.). (2015). *Stone conservation: Principles and practice*. Routledge. <https://doi.org/10.4324/9781315793825>
- Howell, S., & Kones, R. (2017). Calories in, calories out” and macronutrient intake: The hope, hype, and science of calories. *American Journal of Physiology-Endocrinology and Metabolism*. <https://doi.org/10.1152/ajpendo.00156.2017>
- ITRS ERD Working Group. (2011). International Technology Roadmap for Semiconductors 2011 Edition - Emerging Research Devices. In *Chips 2020* (pp. 161-174). Springer, Berlin, Heidelberg.
- Jackowicz, S. (2021). The challenge of online clinical education in the COVID-19 pandemic. In S. Jackowicz & I. Sahin (Eds.), *Online Education during the COVID-19 Pandemic: Issues, Benefits, Challenges, and Strategies* (pp. 347-362). ISTES Organization.
- Jordaan, A. J. J., & Van der Merwe, A. (2015). *Best practices for learning analytics initiatives in higher education*. Universities South Africa.
- Jung, H. J., Fisher, M. B., & Woo, S. L. (2009). Role of biomechanics in the understanding of normal, injured, and healing ligaments and tendons. *BMC Sports Science, Medicine and Rehabilitation*, 1(1), 1-17. <https://doi.org/10.1186/1758-2555-1-9>
- Kirkpatrick, H. B., Brasch, J., Chan, J., & Kang, S. S. (2017). A narrative web-based study of reasons to go on living after a suicide attempt: positive impacts of the mental health system. *Journal of Mental Health and Addiction Nursing*, 1(1), e3-e9. <https://doi.org/10.22374/jmhan.v1i1.10>
- Lohan, E. M. (1998). Making Technology Our Own? Domesticating Technology into Everyday Life. *Science, Technology, & Human Values*, 23(2), 249-252.
- Liston, M. B., Bergmann, J. H., Keating, N., Green, D. A., & Pavlou, M. (2014). Postural prioritization is differentially altered in healthy older compared to younger adults during visual and auditory coded spatial multitasking. *Gait & Posture*, 39(1), 198-204. <https://doi.org/10.1016/j.gaitpost.2013.07.004>
- Loland, S. (2002). Technology in sport: Three ideal-typical views and their implications. *European Journal of Sport Science*, 2(1), 1–11. <https://doi.org/10.1080/17461390200072105>
- Loland, S. (2012). *Journal of the Philosophy of Sport The Ethics of Performance- Enhancing Technology in Sport, September*, 37–41.
- Lyons, E. J., Lewis, Z. H., Mayrsohn, B. G., & Rowland, J. L. (2014). Behavior change techniques implemented

- in electronic lifestyle activity monitors: A systematic content analysis. *Journal of Medical Internet Research*, 16(8), e192. <https://doi.org/10.2196/jmir.3469>
- Maani, A. (2020). The Use of telehealth and telemedicine in medical education: Effects of COVID-19. In I. Sahin & M. Shelley (Eds.), *Educational practices during the COVID-19 viral outbreak: International perspectives* (pp. 63–80). ISTES Organization.
- Madan, D. (2009). System development life cycle methodology. *Information Systems Control And Audit*.
- Maher, C., Ferguson, M., Vandelanotte, C., Plotnikoff, R., De Bourdeaudhuij, I., Thomas, S., Nelson-Field, K., & Olds, T. (2015). A web-based, social networking physical activity intervention for insufficiently active adults delivered via Facebook app: Randomized controlled trial. *Journal of Medical Internet Research*, 17(7), e4086. <https://doi.org/10.2196/jmir.4086>
- Malinauskiene, V., Leisyte, P., Romualdas, M., & Kirtiklyte, K. (2011). Associations between self-rated health and psychosocial conditions, lifestyle factors and health resources among hospital nurses in Lithuania. *Journal of Advanced Nursing*. <https://doi.org/10.1111/j.1365-2648.2011.05685.x>
- Marburger, J. H. (2011). Science, technology and innovation in a 21st century context. *Policy Sciences*, 44(3), 209-213. <https://doi.org/10.1007/s11077-011-9137-3>
- Medeiros, R., Kang, V., Aboubakare, C., Kramer, M., & Dugan, S. A. (2017). Physical activity in an underserved population: Identifying technology preferences. *Journal of Physical Activity and Health*, 14(1), 3-7. <https://doi.org/10.1123/jpah.2016-0162>
- Medina, E. (2015). From cybernetic revolutionaries: Technology and politics in Allende's Chile. *Review: Literature and Arts of the Americas*, 48(1), 109-117. <https://doi.org/10.1080/08905762.2015.1021134>
- Nigg, C. R. (2003). Technology's influence on physical activity and exercise science: The present and the future. *Psychology of Sport and Exercise*, 4(1), 57-65. [https://doi.org/10.1016/S1469-0292\(02\)00017-1](https://doi.org/10.1016/S1469-0292(02)00017-1)
- Paloma, F. G., Agrillo, F., & D'Anna, C. (2013). Parent's perception about motor-sport activity in Italian primary school. *Journal of Human Sport and Exercise*. 8(2), 165-179.
- Polzien, K. M., Jakicic, J. M., Tate, D. F., & Otto, A. D. (2007). The efficacy of a technology-based system in a short-term behavioral weight loss intervention. *Obesity*, 15(4), 825-830. <https://doi.org/10.1038/oby.2007.584>
- Price, D., Wagstaff, C. R. D., & Thelwell, R. C. (2020). Opportunities and Considerations of New Media and Technology in Sport Psychology Service Delivery. *Journal of Sport Psychology in Action*, 1–12. <https://doi.org/10.1080/21520704.2020.1846648>
- Siegel, K. R., Patel, S. A., & Ali, M. K. (2014). Non-communicable diseases in South Asia: Contemporary perspectives. *British Medical Bulletin*, 111(1), 31-44. <https://doi.org/10.1093/bmb/ldu018>
- Shirotriya, A. K. (2021). Online teaching of physical education amidst the COVID -19: Challenges for physical education teachers. In S. Jackowicz & I. Sahin (Eds.), *Online Education during the COVID-19 Pandemic: Issues, Benefits, Challenges, and Strategies* (pp. 389-404). ISTES Organization.
- Shonin, E., & Van Gordon, W. (2015). Practical Recommendations for Teaching Mindfulness Effectively. *Mindfulness*, 6(4), 952-955. <https://doi.org/10.1007/s12671-014-0342-y>
- Sull, D. (2015). The simple rules of disciplined innovation. *McKinsey Quarterly*, 3, 86-97.
- Tyagi, V. V., Rahim, N. A. A., Rahim, N. A., & Selvaraj, J. A. L. (2013). Progress in solar PV technology: Research and achievement. *Renewable and Sustainable Energy Reviews*, 20, 443-461.

<https://doi.org/10.1016/j.rser.2012.09.028>

Vaterlaus, J. M., Patten, E. V., Roche, C., & Young, J. A. (2015). Getting healthy: The perceived influence of social media on young adult health behaviors. *Computers in Human Behavior*, 45, 151-157. <https://doi.org/10.1016/j.chb.2014.12.013>

West, J. H., Hall, P. C., Hanson, C. L., Barnes, M. D., Giraud-Carrier, C., & Barrett, J. (2012). There's an app for that: Content analysis of paid health and fitness apps. *Journal of Medical Internet Research*, 14(3), e1977. <https://doi.org/10.2196/jmir.1977>

Winand, M., & Fergusson, C. (2018). More decision-aid technology in sport? An analysis of football supporters' perceptions on goal-line technology. *Soccer and Society*, 19(7), 966-985. <https://doi.org/10.1080/14660970.2016.1267629>

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