Ann Appl Sport Sci 10(1): e1020, 2022.
http://www.aassjournal.com; e-ISSN: 2322–4479; p-ISSN: 2476–4981. 10.52547/aassjournal.1020

ORIGINAL ARTICLE

Application of YouTube-Based Virtual Blended Learning as a Learning Media for Fundamental Movement Skills in Elementary Schools during the Covid Pandemic 19

[1]Muhamad Syamsul Taufik*, [2]Azi Faiz Ridlo, [3]Soleh Solahuddin, [2]Tatang Iskandar, [4]Bangkit Seandi Taroreh

[1]University of Suryakancana, Jl. Pasirgede Raya, Bojongherang, Kec. Cianjur, Kabupaten Cianjur, Indonesia. [2]University of 45 Islam Bekasi, Jalan Cut Mutia Raya No. 83, Margahayu, Bekasi Timur, RT.004/RW.009, Margahayu, Kec. Bekasi Timur, Indonesia. [3]University of Sriwijya, Jl. Masjid Al Gazali, Bukit Lama, Kec. Ilir Bar. I, Kota Palembang, Sumatera Selatan, Indonesia. [4]University of Bina Darma, Jl. Jenderal Ahmad Yani No.15, 9/10 Ulu, Kecamatan Seberang Ulu I, Kota Palembang, Sumatera Selatan, Indonesia.

Submitted May 19, 2021; Accepted in final form July 28, 2021.

ABSTRACT

Background. This study aimed to obtain an overview of learning outcomes using a virtual YouTube-based application as a medium for fundamental movement skills learning at the Elementary School. **Methods.** The method used in this study was classroom action research. The learning system created and implemented is a YouTube-based virtual learning system. The design used is a cycle model that includes planning, implementing, observing, and reflecting. The population used was a purposive sample of 32 students in 5th grade. The instrument used was in the form of field notes (Duration Recording), namely the use of virtual Blended Learning based on physical education YouTube videos for fundamental movement skills through observation with an average of 55% so that the target achievement was determined with an average of 80%. **Results.** Based on research in cycle I (Actions A, I, and W), 80.43%, because it has not exceeded the research target, it was continued to cycle II. Based on the results of the data analysis, the actions in the second cycle generated a perfect change (85.42%). This change can be seen after applying instructional media and explicit instructions that students can understand. Paired sample t-test shows the results of the value of 50.87 with p=0.000 <0.05, which means that there is an increase in students' fundamental movement skills. **Conclusion.** The fundamental movement skills learning using a virtual YouTube-based application is entirely meaningful in increasing the Learning Media for Sindang Sari 1 Elementary School students.

KEYWORDS: ***Blended Learning, Movement Skills, Learning Media, Elementary School.***

INTRODUCTION

Education in Indonesia is getting more advanced and developed (1-3). While education, in general, is improving, there are still some problems in physical education, such as; physical education teachers do not explicitly accommodate the critical competencies in their programs (4); diverse interests of the stakeholders lead to a disconnect within physical education (5); assessment practices of physical education teachers are still superficial (6), etc. These problems are increasing along with the Covid-19 pandemic, one of which is a large-scale social restriction that can lead to the increasing psychosocial strain (7). Previous studies suggested implementing a technology-based intervention to improve physical activity and health (8, 9).

*. Corresponding Author:
Muhamad Syamsul Taufik, M.Pd.
E-mail: syamsul@unsur.ac.id

A paradigm shift in learning is currently being carried out online (10), especially in the covid-19 pandemic, and requires fast access. The problems found in online learning include the factors of each student who has different characteristics, different levels of concentration, different passions, and different interests. Moreover, the problems could occur because of a less conducive environment, safe and comfortable environment, pleasant learning atmosphere, and a sense of competition (11). The rapid development of technology should be supported by the school, which is considered a second home to get interpreted as a place prepared for students to improve their intelligence, both physical, spiritual, intellectual, social, to teach students to be able to be a person of solid character to realize the educational goals that have been outlined, so that good education always has to start as early as possible through teaching held in school (12), especially in this pandemic situation.

The development of science and technology at this time resulted in the learning media used by learning participants getting better, as we all know with many teaching media that can be used such as audio media (radio, tape-recorders), audio-visual media (television, video, internet, films, etc.) and printed media (textbooks, modules, and worksheets for learning participants). However, now smartphones are also one of the teaching media used by learning participants to get the desired information. Therefore, learning that uses technology-based media is very effective and is supported by educational institutions, students, and all aspects of school (12).

Fascinating learning media will attract more interest, attention, and understanding to the information presented. Based on this opinion, it can be concluded that media is a tool that helps in the learning process of teaching so that the purpose of self-learning can be conveyed; this will be more effective if the media used has the value of interest either from the form, appearance or way of use. One of the media that can be used in learning is e-learning. E-learning and the role of technology in learning in schools have become essential topics in academic and practitioner developments over the past few years. In practice, e-learning has often been applied while remaining focused on delivering existing content, even in a flexible multimedia package in each lesson (13). Learning materials and teaching systems are constantly evolving, just like current technological developments, especially mobile phones, which have become a multifunctional medium in human life today (14).

Blended Learning (BL) is one of the essential pedagogical formats that can improve students' learning quality, optimize active learning strategies, and potentially improve students' learning outcomes (15). BL centered on the development of current technology by combining face-to-face, offline and online learning and assisting the accelerating education, one of them by implementing flip classrooms based on information and communication (16). BL allows students to become more motivated and more involved in the learning process, thus increasing the commitment and perseverance of students (17). It is not surprising that the term BL is applied to various models and methods in the learning process (18).

BL aims to combine e-learning with the advantages that exist in traditional learning so that BL methods can solve the problems that occur in learning practical methods. BL can also be described as learning facilitated by an effective combination of various ways of delivering material, teaching, and learning (19). BL method using interactive media is a solution to adjusting learning styles at this time. BL aims to balance online learning and face-to-face learning (20).

The use of offline and online learning in BL can help facilitate the delivery of aspects of knowledge to students and help students understand the process of learning basic motion. Constructivist learning theory allows learners to build knowledge and learning skills in BL through their experience professionally (21). Thus BL can be considered a profitable learning model because it can be designed to encourage students to be actively involved in the learning process (22). Blended methods can stimulate students to learn independently and continuously. BL is a seamless merging of carefully selected online modules with face-to-face instructions (23), because each participation encourages children to do activities with pleasure. The primary purpose of physical education learning

based on BL is to improve the fundamental skills of motion students.

This study describes several examples of media research results through YouTube for virtual in emphasizing football learning for elementary school students. This is important because the process of delivering materials from educators to learners must be targeted and easy to understand. The learning process takes place well to produce a generation capable of competing and answering future challenges. A previous study states that Activity-Based Learning in elementary school can be integrated with the use of Mobile devices (24), while other studies show that video-based learning improved the learning outcome of elementary school students (25). This study used a virtual YouTube-based application for physical education fundamental movement skills learning at the elementary school.

MATERIALS AND METHODS

The method used in this study is the Qualitative & quantitative Research approach through classroom action research which includes four stages, namely 1) planning, 2) action, 3) observing, and 4) reflection, on each cycle. The role of researchers in this study was physical education teachers who were directly involved in the entire research process, from planning activities to the reflection step in each cycle. In addition, researchers act as planners, observers, data processors, and data analyzers.

Participants. The classroom action research was carried out on Sindang Sari 1 elementary school students with research samples of 32 elementary school 5th grade students, consisting of 18 boys and 14 girls. In order to prevent the sample characteristics deviate from the desired population, it is necessary to determine inclusion criteria prior to sampling. Inclusion criteria are criteria that need to be met by every member of the population that can be taken as a sample. The determining criteria for the sample in this study include: 1) had good communication skills with the teacher, 2) were in the 5th grade of Sindang Sari 1 elementary school, Indonesia, 3) can read and write, 4) the ages were between 11-12 years old, 5) mastered fundamental movement skills. The reason the author chose 5th-grade because of the condition of the class and the students themselves according to the problems taken with consideration of the many problems that exist in elementary school physical education learning, as well as the connectedness between the title of this study and the problems present in the elementary.

BL Design. The system design created and implemented is a virtual-based YouTube application in physical education BL for grade 5 Sindang Sari 1 Elementary School. Previous studies used BL as a learning approach in elementary school (26, 27), while others used BL in physical education learning (28, 29).

A survey by Sloan Consortium showed that 55% of the institutions (e.g., universities) in the United States applied BL (30). The scheme of BL is presented in Figure 1.

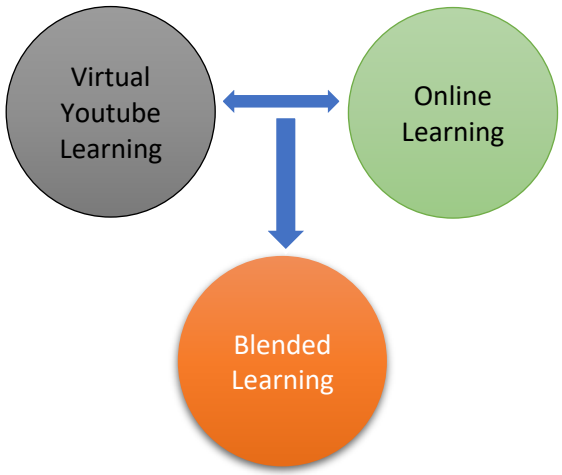

Figure 1. BL Scheme

BL is a highly flexible learning model (31), as it does not depend on time and space for learning and is accessible anytime, anywhere. The activities commonly included in BL include asking, answering, or interacting between students and lecturer and between students. BL is a mix of face-to-face and online interactions that enable collaborative and interactive learning, which is increasingly used as a strategic curriculum (32). Through BL, students will be actively involved in the teaching and learning process, thereby helping them develop their skills of self-reflection, self-direction, and self-management (33). In addition, BL has the potential to lead students towards developing their learning autonomy and responsibility as well as metacognitive processes (34). BL implementation can facilitate a communicative learning environment, creating meaningful

learning outcomes (35). However, teachers' lack of a proper understanding of BL will inhibit the attainment of expected learning outcomes (36). Previous studies have been done on the effectiveness of BL in individual courses, but there has been a dearth of research that can provide guidelines at the level of institutions (37).

Table 1. Virtual Learning Plan

NO	Resulting Learning Media	Description
1	Media Virtual, Warming Up Static, dynamic warm-up Core exercises: run 5 m in front of the house with bottles as the obstacles, Cooling down: dynamic cooling down and PNF	

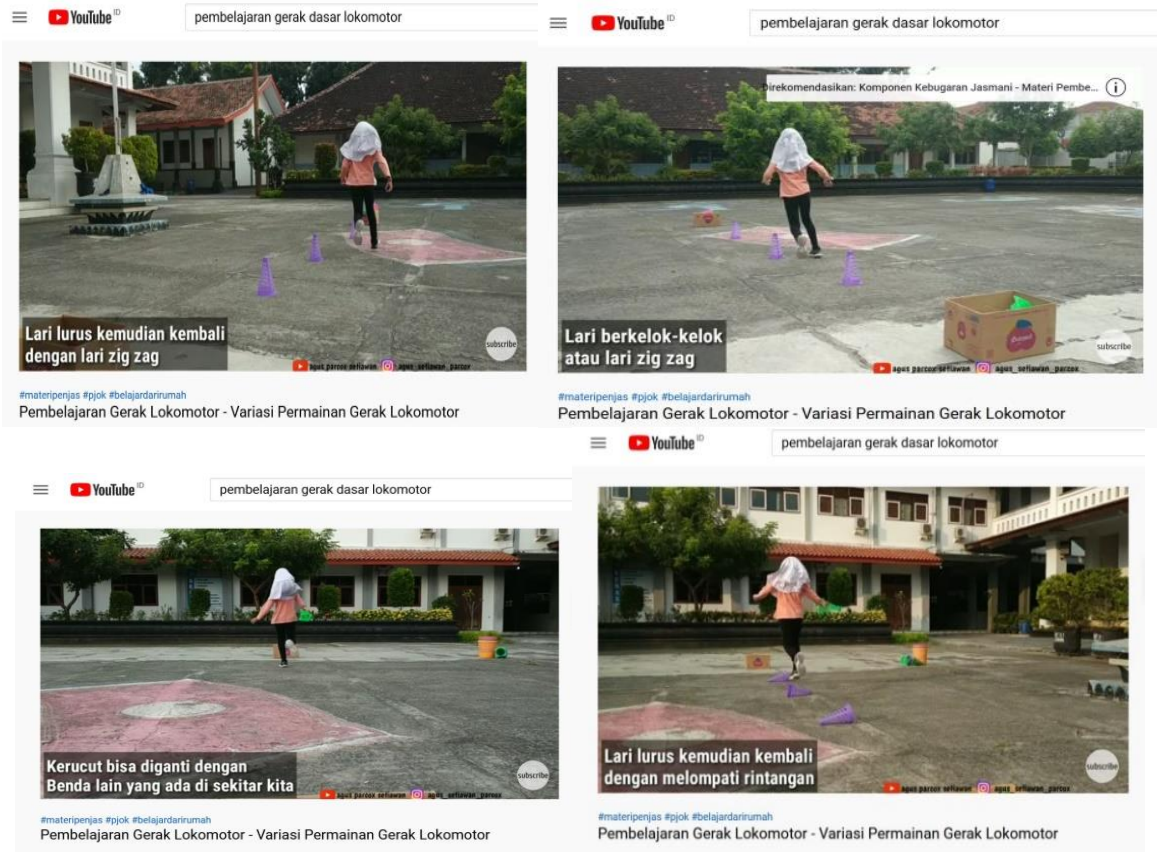

Figure 2. YouTube Media Learn Online

Data Collection. Data collection techniques are carried out using a qualitative & quantitative approach through classroom action research. In general, the data collection activities are carried out through the following steps: (a) Studying all the data that has been collected. The data collection was conducted through an actual motion understanding tests using Google Form, (b) by Producing advanced data by performing treatment activities using fundamental motion learning, and (c) by concluding and verify with the final test results learning outcome with the final test movement through actual motion understanding tests using Google Form.

Data was collected through Google Form and structured interviews. The findings suggest that the briefing model should consist of: 1) core competencies and essential competencies; 2)

Collaboration of Teachers and Students with multi-aspects, namely pedagogy, personal, professional, and social aspects; 3) sharing learning resources by leveraging the advantages of learning resources on campus and partner schools. Table 1 shows an example of virtual learning.

Data Analysis. Data analysis is done descriptively by comparing achievement results with success indicators. The qualitative method was used to explain the events carried out in this study to get a complete picture and explain the implementation of action research. The quantitative method was used to analyze data on the learning process results and compare students' learning outcomes before and after the action. Paired sample t-test was conducted to observe the effect significance of the treatment.

RESULTS

Before acting, researchers carried out pre-observation activities to identify problems in classroom action research. This initial observation activity was carried out and centered on the implementation of learning that aims to know the extent of learning activities teaching physical, educational mobility skills implemented at Sindang Sari 1 elementary school so that it can be raised problems that occur and find solutions in solving the problem mentioned. The most important observation in this action study is directed at the problem of student motion skills at home that students use in the learning process.

The mechanism of the results obtained in learning has changed slightly with the emergence of covid-19, which has created significant changes in the implementation of learning assessments using assistive instruments such as Google Form or other online instruments. This study used Google Form and structured interviews to collect data.

This initial observation is a step as an overview to determine the classroom action research steps.

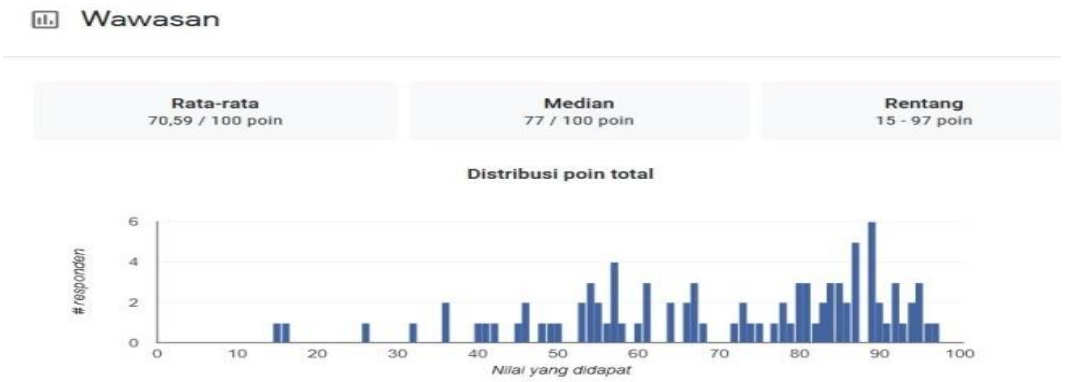

Figure 3. Analysis of Google Form Results

Table 2. Results of Pre-Action

Action	A	I	W	Amount
Pre-action	55.64%	60.16%	65.54%	181.34 %

Table 3. Results of Cycle I

Action	A	I	W	Amount
Cycle I	74.13%	78.99%	85.42%	238.54 %

Table 4. Results of Cycle II

Action	A	I	W	Amount
Cycle II	76.16 %	79.90%	86.67%	242.27%

Table 5. Average Results

Action	Amount	Average
Pre-cycle	181.34 %	60.45%
Cycle I	238.54 %	79.51%
Cycle II	242.27 %	80.43%

In the course of several actions and the learning process, to improve the skill of motion through the utilization of virtual learning media, namely YouTube physical education, it is confirmed that the ability of students in each activity undergoes a slight change that is felt sufficient, nevertheless has not reached the target stipulate.

Then the results obtained by using the results obtained that the ability of elementary school students of Sari 1 session with the use of the Google Form instrument gets the results then the stages of using virtual learning using YouTube and BL here can achieve good results.

Changes that are expected to appear were the category of learning activities (A), instruction category (I), or waiting category (W) before the action can be seen in Table 2.

Before the action, students' learning activities were 55.64%, while the instruction category and waiting categories were 60.16% and 65.54%. The total percentage of the three categories is 181.34%.

There were significant changes in the category of learning activities (A), instruction category (I), or waiting category (W) after the BL application in cycle I, which can be seen in Table 3.

Cycle I shows that there are significant improvements in students' three categories. The learning activities of students after the action in cycle I was 74.13%, while the instruction category and waiting for category respectively 78.99% and 85.42%. The total percentage of the three categories is 238.54%.

While there are improvements in the category of learning activities (A), instruction category (I), or waiting category (W) after the BL application in cycle II, the changes are not as significant as in cycle II, which can be seen in Table 4.

The results of cycle II show the changes in students' three categories were not as much as in cycle I. After the action in cycle II, students' learning activities were 76.16%, while the instruction category and waiting for category respectively 79.90% and 86.67%. The total percentage of the three categories is 242.27%. The average results of every cycle can be seen in Table 5. The table above can be interpreted into a diagram as follows:

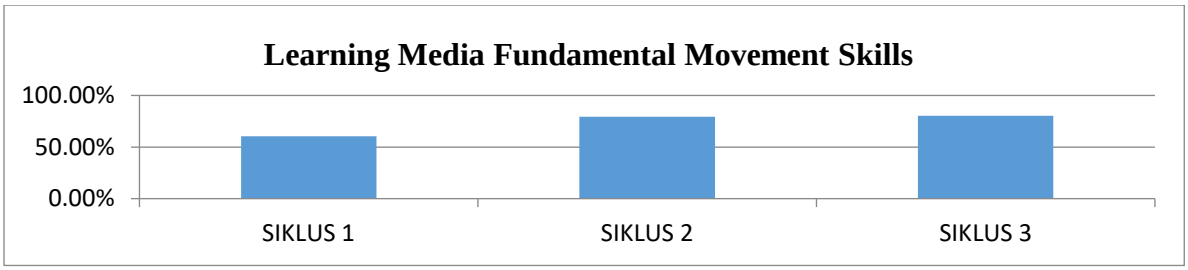

Figure 4. Diagram Cycle Results

Table 6. Paired Two Sample T-test for Means

	Variable 1	Variable 2
Mean	0.604466667	0.8091
Variance	0.002456413	0.002838
Observations	3	3
Pearson Correlation	0.993414907	
Hypothesized Mean Difference	0	
df	2	
t Stat	-50.87122651	
P(T<=t) two-tail	0.000386193	
t Critical two-tail	4.30265273	

Based on the diagram above, this study shows a significant increase in each category in learning after students show a satisfactory response when the researcher applies the learning method by utilizing physical education learning media marked by student activities in PBM. To observe the effect significance of the treatment, paired sample t-test for means was conducted, which can be seen in Table 6.

Table 6 shows the results value of 50.87 with $p=0.000 < 0.05$, which means a significant improvement in students' fundamental movement skills.

DISCUSSION

The findings of each implementation of this action research are as follows: 1) Before implementing BL in cycle I, the average results of pre-cycle in all categories were: action A 55.64%, an action I 60.16%, and action W 65.54%. The students before action have not focused on the learning media, which showed several things happening, such as the movement task was not very well done. Students do the task of barging, and their active learning time is not used correctly. 2) In the implementation of a cycle I, the average result of the action in all categories was: action A 74.13%, an action I 78.19%, and action W 85.42%, which indicates a perfect change. Although there was a change in the percentage of learning activities, it did not reach the predetermined target and continued to cycle II. 3) In the implementation of cycle II the average result of the action in all categories was: action A 76.16%, an action I 79,90%, and action W 86,67%.

These changes can be seen starting from the number of learning media used, then providing clear directions so that students can understand them. The actions given by the researchers were the implementation of physical education learning media and movement tasks that were explained before the learning and providing good learning tools so that no time was wasted during the learning process. Based on the results of the analysis of this study, there was an increase in each category even though the increase in cycle II was lower than in cycle I. This was because the learning media had begun to attract students' attention in cycle I, while in cycle II, students had already adapted to the learning. All students have used the learning tools and minimized waiting time to do motion assignments. A previous study mentioned that physical educators must create a learning environment with decreased teacher management time, waiting time, and high overall academic learning time (38).

Based on the three points above, the research results were obtained in the form of an increase in the learning achievement of physical education using BL can be described as follows: students become more focused, disciplined, innovative, creative, and interactive in physical education learning. Based on the average of the actions A, I, and W (80.43%), the implementation of BL in cycle II exceeded the research target and did not continue to cycle III.

In line with previous studies that show that BL can improve students learning outcomes (23, 39), the paired sample t-test shows an increase in students' fundamental movement skills with the application of blended learning using the YouTube application in this study. Based on this analysis, it can be said that there has been an increase in the application of YouTube-based virtual blended learning as a learning medium for fundamental movement skills in elementary schools during the Covid-19 pandemic. This is in accordance with several previous studies that used YouTube as a complementary learning tool for teaching and learning (40-42). It can be concluded that the learning outcome using a virtual application based on YouTube is entirely meaningful in improving the Learning Media for Fundamental Movement Skills at Sindang Sari 1 Elementary School.

This study was limited by the time and conditions of the Covid-19 pandemic so that the sample taken is limited to 5th-grade students only. Future research can use a broader range of samples so that the results of fundamental motion learning through BL for all grade levels of elementary students can be seen.

CONCLUSION

The application of BL, especially in physical education in schools, assists and facilitates the learning process, starting from introduction, core to closing on each core / fundamental competency based on scientific methods. Based on the results of the analysis and the results of data processing, it can be concluded that the use of physical education learning media in understanding fundamental movement skills in the background of classroom action research through virtual learning with YouTube has a significant impact on students' fundamental movement skills learning outcome, or it can be said that students have a better understanding of fundamental movement skills. Future research can use different media platforms and broader sample grades.

APPLICABLE REMARKS

- This study supports that YouTube-based virtual BL can improve fundamental movement skills learning outcomes of 5th-grade students in elementary school.

FUNDING/SUPPORTS

We are grateful for the support of the Indonesian Sindang Sari 1 Elementary School, Bogor regency, Indonesia. We are also grateful

for the support from the campus department and the extended family of the Jakarta State University Physical Education Doctoral Program.

FINANCIAL DISCLOSURE

The authors reported no potential conflict of interest.

REFERENCES

1. Wijaya H. Redefining the Success of Education: Where Indonesia Has Excelled and Where It Has Not. *J Hum*. 2019;**31**(2):118. **doi:** 10.22146/jh.v31i2.36532
2. Sudarman E, Sawitri NN, Luhar BG. Development of education in Indonesia an effort to strengthening innovation systems and international competitiveness. Vector Eur.2016.
3. Raihani. Education reforms in Indonesia in the twenty-first century. *Int Educ J*. 2007;**8**(1):172-183.
4. Lleixà T, González-Arévalo C, Braz-Vieira M. Integrating key competences in school physical education programmes. *Eur Phys Educ Rev*. 2016;**22**(4):506-525. **doi:** 10.1177/1356336X15621497
5. Carse N, Jess M, Keay J. Primary physical education: Shifting perspectives to move forwards. *Eur Phys Educ Rev*. 2018;**22**(4):487-502. **doi:** 10.1177/1356336X16688598
6. DinanThompson M, Penney D. Assessment literacy in primary physical education. *Eur Phys Educ Rev*. 2015;**21**(4):485-503. **doi:** 10.1177/1356336X15584087
7. Ammar A, Mueller P, Trabelsi K, Chtourou H, Boukhris O, Masmoudi L, et al. Psychological consequences of COVID-19 home confinement: The ECLB-COVID19 multicenter study. *PLoS One*. 2020;**15**(11):e0240204. **doi:** 10.1371/journal.pone.0240204 **pmid:** 33152030
8. Ammar A, Chtourou H, Boukhris O, Trabelsi K, Masmoudi L, Brach M. Covid-19 home confinement negatively impacts social participation and life satisfaction: A worldwide multicenter study. *Int J Environ Res Public Health*. 2020;**17**(17):1-17.
9. Ammar A, Trabelsi K, Brach M, Chtourou H, Boukhris O, Masmoudi L, et al. Effects of home confinement on mental health and lifestyle behaviours during the COVID-19 outbreak: insights from the ECLB-COVID19 multicentre study. *Biol Sport*. 2021;**38**(1):9-21. **doi:** 10.5114/biolsport.2020.96857 **pmid:** 33795912
10. Victorian AR, Aryanti S, Yusfi H, Solahuddin S, Bayu WI. Perspektif Calon Guru Pendidikan Jasmani Terhadap Pembelajaran Online Selama Pandemi Covid-19. *JOSSAE J Sport Sci Educ*. 2021;**6**(1):94. **doi:** 10.26740/jossae.v6n1.p94-106
11. T S, AV CJ, Harshith N, S JE, S SG, M P. Learning Analytics: Virtual Reality for Programming Course in Higher Education. *Procedia Comput Sci [Internet]*. 2020;**172**(2019):433-437. **doi:** 10.1016/j.procs.2020.05.095
12. Marini D, Cowley F, Belson S, Lee C. The importance of an audio cue warning in training sheep to a virtual fence and differences in learning when tested individually or in small groups. *Appl Anim Behav Sci [Internet]*. 2019;**221**(August):104862. **doi:** 10.1016/j.applanim.2019.104862
13. Margaryan A, Collis B, Cooke A. Activity-based blended learning. *Hum Resour Dev Int*. 2004;**7**(2):265-274. **doi:** 10.1080/1367886042000167657
14. Celikhan S. An Integrated Project on Sports Training in Preschool, Elementary and Secondary Education Institutions. *Procedia - Soc Behav Sci [Internet]*. 2012;**46**:1933-1938. **doi:** 10.1016/j.sbspro.2012.05.405
15. Pizzi MA. Blended learning pedagogy: the time is now! *Occup Ther Health Care*. 2014;**28**(3):333-338. **doi:** 10.3109/07380577.2014.908479 **pmid:** 24971898
16. Pate RR, Dowda M, Dishman RK, Colabianchi N, Saunders RP, McIver KL. Change in Children's Physical Activity: Predictors in the Transition From Elementary to Middle School. *Am J Prev Med*. 2019;**56**(3):e65-e73. **doi:** 10.1016/j.amepre.2018.10.012 **pmid:** 30655084
17. Poon J. Blended learning: An institutional approach for enhancing students' learning experiences. *J online Learn Teach*. 2013;**9**(2):271.
18. Rose R, Ray J. Encapsulated presentation: A new paradigm of blended learning. *Educ Forum*. 2011;**75**(3):228-243. **doi:** 10.1080/00131725.2011.57680
19. Tsai CW, Shen PD, Tsai MC. Developing an appropriate design of blended learning with web-enabled self-regulated learning to enhance students' learning and thoughts regarding online learning. *Behav Inf Technol*. 2011;**30**(2):261-271. **doi:** 10.1080/0144929X.2010.514359

20. Cleaver JE, Thomas GH. Rapid diagnosis of sensitivity to ultraviolet light in fibroblasts from dermatologic disorders, with particular reference to xeroderma pigmentosum. *J Invest Dermatol*. 1988;**90**(4):467-471. **doi:** 10.1111/1523-1747.ep12460917 **pmid:** 3351331
21. Mirriahi N, Alonzo D, McIntyre S, Kilgyte G, Fox B. Blended learning innovations : Leadership and change in one Australian institution Negin Mirriahi , Dennis Alonzo , Simon McIntyre , Giedre Kligyte and Bob Fox. *Int J Educ Dev Using Inf Commun Technol*. 2015;**11**(1):4-16.
22. Alruwaih ME. Effect of Blended Learning on Student' S Satisfaction for Students of the Public Authority for Applied Education and Training in Kuwait. *Sci Mov Heal*. 2015;**XV**(2):442-449.
23. Francis R, Shannon SJ. Engaging with blended learning to improve students' learning outcomes. *Eur J Eng Educ*. 2013;**38**(4):359-369. **doi:** 10.1080/03043797.2013.766679
24. Lijanporn S, Khlaisang J. The Development of an Activity-based Learning Model Using Educational Mobile Application to Enhance Discipline of Elementary School Students. *Procedia - Soc Behav Sci*. 2015;**174**:1707-1712. **doi:** 10.1016/j.sbspro.2015.01.825
25. Silverman RD, Artzi L, McNeish DM, Hartranft AM, Martin-Beltran M, Peercy M. The relationship between media type and vocabulary learning in a cross age peer-learning program for linguistically diverse elementary school students. *Contemp Educ Psychol*. 2019;**56**:106-116. **doi:** 10.1016/j.cedpsych.2018.12.004
26. Kazakoff ER, Macaruso P, Hook P. Efficacy of a blended learning approach to elementary school reading instruction for students who are English Learners. *Educ Technol Res Dev*. 2018;**66**(2):429-449. **doi:** 10.1007/s11423-017-9565-7
27. Panjaitan R, Murniarti E, Sihotang H. Learning Plan with Blended learning in Elemetary School. *Adv Soc Sci Res J*. 2021;**8**(2):558-572. **doi:** 10.14738/assrj.82.9758
28. Hassan A, Qudah A, Malaysia U, Salleh P, Rashid A. The Impact Of Blended Learning In Improving Fitness Elements At Sixth Grade Students In Jordan. *J Entrepreneurship Educat*. 2018;**21**.
29. Calderón A, Scanlon D, MacPhail A, Moody B. An integrated blended learning approach for physical education teacher education programmes: teacher educators' and pre-service teachers' experiences. *Phys Educ Sport Pedagog*. 2020. **doi:** 10.1080/17408989.2020.1823961
30. Allen IE, Seaman J, Garrett R. The Extent and Promise of Blended Education in the United States.
31. Pavla S, Hana V, Jan V. Blended Learning: Promising Strategic Alternative in Higher Education. *Procedia - Soc Behav Sci*. 2015;**171**:1245-1254. **doi:** 10.1016/j.sbspro.2015.01.238
32. Cooner TS. Learning to Create Enquiry-based Blended Learning Designs : Resources to Develop Interdisciplinary Education Learning to Create Enquiry-based Blended Learning Designs : Resources to Develop Interdisciplinary Education. 2016;**5479**(4).
33. de George-Walker L, Keeffe M. Self-determined blended learning: A case study of blended learning design. *High Educ Res Dev*. 2010;**29**(1):1-13. **doi:** 10.1080/07294360903277380
34. Bonk CJ, Kim K. Published by Pfeiffer - An Imprint of Wiley, 989 Market Street, San Francisco, CA 94103-1741. Available from: www.pfeiffer.com.
35. Okaz AA. Integrating Blended Learning in Higher Education. *Procedia - Soc Behav Sci*. 2015;**186**:600-603. **doi:** 10.1016/j.sbspro.2015.04.086
36. Taylor P, Francis R, Shannon SJ. European Journal of Engineering Engaging with blended learning to improve students' learning outcomes.2015.
37. Graham CR, Woodfield W, Harrison JB. A framework for institutional adoption and implementation of blended learning in higher education. *Internet High Educ*. 2013;**18**:4-14. **doi:** 10.1016/j.iheduc.2012.09.003
38. Luis J, Minguet C, López Fernández I. Eff ect of Class Content on Practice Time in the Physical Education of Elementary and High School Students.2010.
39. Dewantara D, Wati M, Mahtari S, Haryandi S. Blended Learning to Improve Learning Outcomes in Digital Electronics Courses.2020.
40. Moghavvemi S, Sulaiman A, Jaafar NI, Kasem N. Social media as a complementary learning tool for teaching and learning: The case of youtube. *Int J Manag Educ*. 2018;**16**(1):37-42. **doi:** 10.1016/j.ijme.2017.12.001

41. Yildirim B, Basaran O, Alatas OD, Yeniceri EN, Alatas OD, Yeniceri EN, et al. Chest tube insertion techniques on YouTube: is social media a reliable source of learning medical skills? *Am J Emerg Med*. 2015;**33**(11):1709-1710. **doi:** 10.1016/j.ajem.2015.08.040 **pmid:** 26386736
42. Azer SA, AlKhawajah NM, Alshamlan YA. Critical evaluation of YouTube videos on colostomy and ileostomy: Can these videos be used as learning resources? *Patient Educ Couns*. 2021. **doi:** 10.1016/j.pec.2021.05.023 **pmid:** 34045092