

## ISSUES AND FUTURE TRENDS IN TEACHING AND LEARNING PHYSICAL EDUCATION: PRELIMINARY STUDY

Lee Boon Kiat<sup>1</sup>, Noor Dayana Abd Halim<sup>2</sup>, Mohamad Bilal Ali<sup>3</sup> and Halijah Binti Ibrahim<sup>4</sup>

---

This study discusses the issues and future trends of teaching and learning physical education subject. The finding is elicited from a preliminary study through an interview conducted with four physical education teachers. Three issues and a suggestion were identified after conducting a thematic analysis of the interview transcript. The issues are time factor in physical education class, teaching method, students' reaction during physical education class and future trends in teaching and learning physical education. Physical education is important for a child's development from the cognitive, social and physical health aspect. Physical education is not emphasized in school. Several recommendation and suggestion are also discussed at the end of this study. Based on the findings, a new teaching method must be devised to prevent the lack of interest in learning physical education in the classroom.

**Keywords:** Thematic Analysis, Physical Education, Time Factor, Teaching Method, Future Trends, Mobile Learning.

### 1. INTRODUCTION

Physical education is a subject that is compulsory in primary and secondary school in Malaysia (Pate, O'Neill and McIver, 2011). This subject is important in the development of children. Physical education subject teaches the children the importance to maintain their physical health and provide the first exposure to the children to learn the psychomotor skills in certain sport (Shariffudin, Mislán, Wong and Julia, 2011). Besides that, physical education also important to children as it encourages them intrinsically (intellectual, spiritual, emotional, academic performance) and extrinsically (body composition, fitness and muscular) (Pate, O'Neill and McIver, 2011; Bailey, 2005; Bailey, 2006). Several studies support this notion that physical education enhances children intrinsically such as self-confident, self-esteem, social skill, cognitive development and academic achievement (Bailey, 2005). Meanwhile, an increase in the overall daily physical activity of children also can improve their physical health during pre-adolescent (Bailey, 2005) and provide short-term as well as long-term impact to their health

---

<sup>1</sup> Universiti Teknologi Malaysia, E-mail: boonkiatlee2000@yahoo.com

<sup>2</sup> Universiti Teknologi Malaysia, E-mail: noordayana@utm.my

<sup>3</sup> Universiti Teknologi Malaysia, E-mail: mba@utm.my

<sup>4</sup> Universiti Teknologi Malaysia, E-mail: p-halija@utm.my

condition (Pate, O'Neill and McIver, 2011; Williams, Pfeiffer, O'Neill *et al.*, 2008; Dwyer, Sallis, Blizzard, 2001). Today, the main concern for school and parents are the children's academic performance. However, there are several studies which indicates that children who are active in sports, have greater academic achievement compared to those who are inactive in sports (Barber, Eccles and Stone, 2001 and Coe, Pivarnik and Womack, 2006). Shephard (2012) supports this statement which statement which indicates that physical activity provides positive impact to children's attention in classroom and train them have greater personality, behavior and academic performance through physical education class. Therefore, physical education subject has positive relationship with children's participation in physical activity, academic achievement and behavior.

## **2. BACKGROUND OF PROBLEM**

Physical education is a subject that teaches the students on the awareness to health issues and also provided exposure to the students on physical activity (Ministry of Education Malaysia, 2012). According to the Malaysia Education Syllabus, the topics of physical education are categorized into two; physical activity and health education (Ministry of Education Malaysia, 2012). These two categories contain many topics that need to be taught by the teachers, and the teachers conduct the class inside or outside the classroom depending on the suitability of the activities.

In the Malaysian physical education syllabus, teachers are required to teach the topics that are related with body composition such as muscular system and cardiovascular system (Ministry of Education Malaysia, 2012). These topics are best explained with images or by using video clips (Lee Boon Kiat, Noor Dayana and Halijah, 2015). However, teachers still use the traditional teaching method, using the textbook provided by the Ministry of Education, Malaysia. Although the textbook provided by Ministry of Education has a lot of useful information, but the information is textual and does not attract the students' attention (Lee Boon Kiat, Noor Dayana and Halijah, 2015). Therefore, teachers have to spend more time to teach or explain the topic or find other relevant materials to teach the students and make sure every student are understand about the related topics. Currently, the students live in the information technology age (Kukulka Hulme and Sharples, 2009; Steel, Springett and Kirk; Chiong and Shuler, 2010; Melhuish, Falloon and Melhuish, 2010). Teachers should fully utilize the advantage of technology to obtain relevant teaching materials such as video clip and animation from the internet or other sources (Masats and Dooly, 2011) to assist the teachers to achieve the learning objective in classroom. Creativity to organize the classroom and teaching method is important to attract the interest of students to learn or encourage them to participant in physical activity outside the classroom. The perception of teachers in teaching physical education is also important in educating the students.

The perception of teachers in teaching physical education subject is very important because it directly impact the students' development (Bailey, 2006). The interest of the teacher to educate the students is vital in encouraging and motivating the students to further learn in the academic proses (Dewey, 1913). Motivation plays an important role in academic performance because it directly influences the students' behavior and interest in the learning process (Lerikkanen, Kiuru, Pakarinen *et al.*, 2012). Thus, teachers have to select the appropriate teaching method to enhance students' interest in physical education. A study showed that inappropriate teaching method results in the decline of students' learning interest (Lu and Deng, 2014).

By concern to the problem discussed above, this study discusses the issue and future trends in teaching physical education. These two points are very important to be reviewed since physical education classes are usually being replaced with other class or subject in school.

### **3. METHODOLOGY**

This study was conducted by using interview method with four physical education teachers. Interview method used to conduct this study because this method allows researcher to know or understand in-depth the real situation in school on the issues occurred in physical education class. From the interview transcript, researcher able to identify or summaries the issues based on the thematic analysis. There are four physical education teachers participate in this study and they are fresh graduated teachers which are from university within five years. This study used purposive sampling as sampling method because the purpose of this study is to identify the issues happened in physical education class in this technology era. The teachers who are fresh graduate from university are familiar with technology used during their study.

### **4. RESULTS AND FINDING**

The finding of this study is based on a preliminary study conducted with four physical education teachers. A preliminary study had to execute in physical education subject because there are limited references and researches that related with the issues especially in Malaysia. Four teachers are interviewed and the interview transcripts are analyzed using thematic analysis. From the analysis, three issues and a suggestion were identified. The issues and suggestion are; time factor in physical education class, teaching method, students' reaction during physical education class, and future trends in teaching and learning physical education. These issues and suggestion are important to help the teachers to review and make changes in their teaching approach.

#### 4.1 Time Factor In Physical Education Class

Based on the finding, the first issue identified is time factor. According to the respondents, the duration for physical education class is only two periods of 35 minutes each, once a week. The duration of the physical education class is insufficient to teach all the topics inclusive of physical activity and physical health. A respondent mentioned that 70 minutes to teach a physical activity lesson is insufficient due to inadequate time. Therefore, the respondent teaches theory for the first 35 minutes and the remaining 35 minutes for a practical lesson. Some sport skills are required to be practiced repeatedly to understand and learn the appropriate skills. There is a report which states that the time for a physical education class should at least be within 75-105 minutes per week (Indiana Standards, 2000). Another report also mentioned that the physical education class may require at least 150 minutes per week for elementary school level and 225 minutes per week for middle and secondary school level to reach the high quality of physical education program (National Standards for Physical Education, 2013). Moreover, the report from Indiana Standards (2000) and National Standards for Physical Education (2013) mentioned that 70 minutes for teaching physical education class is insufficient to complete teaching syllabus designed for the subject.

#### 4.2 Teaching Method

The second issue identified from the findings is the teaching method. Integrated technology in education had been introduced to school for a long time (Hashemi, Azizinezhad, Najafi *et al.*, 2011; Pannabecker, 1995) and several studies show that, by integrating technology in the education assists the learning process as well as teaching process among teachers (Conejar and Kim, 2014 and Kim and Holmes, 2006). Based on the finding, the respondents still use the traditional teaching method. The respondents teach physical education subject by the textbook. Two of the respondent do not often use textbook to teach in the class but uses other teaching aids. However, one of the respondents mentioned that he uses textbook and PowerPoint if the classroom is installed with the equipment such as computer and LCD projector. The conversations are as below.

*Respondent 1 and 2*

“I often do not use the textbook and I use the textbook only as a reference because I will find other references which are beyond the textbook to teach the students. This will attract the students and the students can get more “surprises” when they are learning certain topic.”

*Respondent 4*

“I use the textbook and power point slides when I teach this subject. Some of the classes are installed with LCD so I can use power point to teach. However, not all the class has LCD. For the class that is not installed with LCD, I have to use textbook to teach the students.”

The findings show that the teachers still use the traditional teaching method to teach the students and the equipment provided is limited. The teachers are unable to fully utilize the equipment in the teaching process. However, teachers can attract the students' attention when they use other teaching aids.

### **4.3 Students' Reaction during Physical Education Class**

Appropriate teaching method is very important in the teaching process because it influences the students' learning behavior. The findings show that teacher's still uses the traditional teaching method to teach physical education subject. The students are uninterested and bored to learn the subject when taught in the classroom. The findings also show that teaching methods which are "boring" and "uninteresting" affects the students' attitude, and this may cause students do not bring the physical education textbook to school. However, the students show different attitude of learning when teachers teach the topics with the assistance of some teaching aids or doing some interesting activities. The students are more focused and willing to participate in activities when the subject is taught with other teaching materials except the textbook. Moreover, physical education is not a core subject in the examination. This may be among the reasons that students are not interested in this subject. The respondents suggest that by integrating technology in the teaching and learning process may be able to attract the students' attention in the classroom and it may help the teachers in teaching process too. The findings are as below.

*Respondent 1*

"The students are aware that this subject is not a core subject in examination such especially so they do not take it seriously. They also does not show interest or enjoyment when I use textbook to teach this subject."

*Respondent 2*

"I use textbook to teach in class and the students feel boring in this subject and some of them purposely don't bring the textbook to school. When I use teaching aids in class, the situation in class is different. The students show interest and focus to the topic that I teach"

*Respondent 4*

"I use textbook and power point. There is a lot different when I use these two types of method. When I use textbook in my lesson, it is difficult to attract the students' attention. If I use power point, the students are interested and it is easier to attract the students' attention because I can add some image into the power point slides."

### **4.4 Future Trends in Teaching and Learning Physical Education**

The findings show that when the teacher uses the traditional method in the teaching process, the result may show negative outcome. A solution or suggestion is needed to overcome this problem to prevent the situation from worsening. There are some

suggestions suggested by the respondents; integrating multimedia elements in teaching process. The integration of multimedia element in the teaching and learning process entice students' attention and also provide positive impact to the students' interest for physical education (Lee Boon Kiat, Noor Dayana and Halijah, 2015). The respondents also suggest that usage of video also provide benefit in the teaching and learning process. For example, integrating video in teaching and learning allows the students to attain better understanding of the subject matter as audio visual provides conducive learning environment (Lee Boon Kiat, 2014). Audio and video assist teachers in teaching the skills that they do not comprehend. The teaching material in form of audio video can provide the correct techniques to perform the skills and preventing the students' getting injury. The respond is shown as below.

*Respondent 1 and 2*

"It is very helpful. For example, if we use video to teach about the topic of cardiovascular, I think the lesson will become more interesting because the topic is show in visual method. Besides that, it also can encourage the students to know more about the topic. If we teach this kind of topic by using textbook, the students may find it hard to understand. I think this is very good and helpful if we have this kind of teaching material."

## **5. DISCUSSION**

There are three issues and a suggestion identified in the findings. All these issues are important to be reviewed to overcome the problem that occurs in school. Firstly, teachers have insufficient time to teach all the topics designed in the subject by using traditional teaching method. The teachers have to increase the pace of teaching due to insufficient time and this may be the cause inability by the students to adapt the teaching and learning mode and resulting in the decrease of the learning interest (Lu and Deng, 2014). Due to insufficient time, teachers implement teacher-centered style to complete the required task of the syllabus and it affects the teaching quality and the inability of the teachers in imparting knowledge effectively (Wang, 2011). Few studies compare the effectiveness between traditional and new teaching method from the aspect of time factor, and the result shows that new teaching method with integrated technology is less time consuming (Mulig and Rhame, 2012). This may able to improve the interest and attention when teachers teach physical education subject in the classroom. There is difference by integrating technology in the teaching and learning process compared to face-to face teaching style in classroom in term of students' interest and enjoyable towards the physical education subject. In fact, at the end of the year, the teachers are required to complete the syllabus (Irby and Wilkerson, 2008).

Secondly, teaching method is important to increase students' interest and encourage them to be involved in the physical education activities. Teachers play important roles as teachers' instruction influence students' interest in an academic task (Lerkkanen, Kiuru, Pakarinen *et al.*, 2012). The findings show that the

respondents apply traditional teaching method in the classroom. Although traditional teaching methods tend to encourage passive learning but the students may not have the chance to critically appraise the new knowledge (Cantillon, 2003). Besides that, choosing teaching media is important in encouraging (Cantillon, 2003) and motivating students to enhance their behavior and effort in a learning situation (Lerikkanen, Kiuru, Pakarinen *et al.*, 2012). The teacher should apply two way interactions by asking question and encouraging them to participate in the question and answer session. It may take some time to let the students change the mode from listening to thinking (Cantillon, 2003). Since the time to teach physical education subject is insufficient, the interaction between teachers and students declines.

Next, the students' behavior and effort depends on the interaction and class instruction by teachers. Students may show positive effort when the teacher uses the appropriate teaching technique or motivation strategies. Besides that, this may able to attract the attention of the students who are less interested in this subject. This is supported by several studies which mentioned to sustain motivation or engaging the interest of students during the lesson is important because it directs students' behavior and effort in the learning process (Lerikkanen, Kiuru, Pakarinen *et al.*, 2012 and Kretschmann, 2014). When the students show improved effort in class, it also helps the teachers to achieve teaching objective and the learning environment also becomes more enjoyable. When teachers select the teaching strategies, the teachers have to consider two factors which influence students' motivation to participate in physical education class; from the internal and external aspects (Kretschmann, 2014). The internal aspects include; individual characteristics (*e.g.* age, gender, physical attributed), dispositional variable (*e.g.* attitude, task and ego orientation, intrinsic motivation) and individual situational variable (*e.g.* sport practice involvement that motives for sport participant, perception of success) (Blanchard, Mask, Vallerand *et al.*, 2007 and Cloes, 2005). External factors include environment situation variable (*e.g.* teacher's expertise, school characteristics, parents' involvement, providing choice) and contextual variable (*e.g.* Physical education curriculum, Physical education program, physical education teacher) (Blanchard, Mask, Vallerand *et al.*, 2007 and Cloes, 2005 and Xu and Liu, 2013). Hence, the teachers are able to design or use the effective teaching method based on the characteristics of the students and encourage the students in learning this subject.

## **6. RECOMMENDATION**

Recommendation is important for future study to overcome the issues that are identified in this study. The respondents' suggestion is aligned with the future trends in education; which is integrating mobile technology in education, Mobile Learning (M-Learning).

In past ten years, technology is widely used and influences on all aspects of society from business, health, entertainment and also education (Hashemi, Azizinezhad, Najafi *et al.*, 2011 and Martin, Diaz, Sancristobal *et al.*, 2011). Mobile learning is a new trend in the education field (Martin, Diaz, Sancristobal *et al.*, 2011 and Falloon, 2013 and Fraga, 2011). Mobile technology has huge potential to provide a better learning environment with the advantage of dynamic learning environment (Keengwe and Bhargava, 2014). A report shows that the ownership of mobile device and gadget is increasing and the number is still growing (Telstra, 2011). Since the children are exposed to the technology boom, teachers should try to integrate mobile technology in the teaching and learning process. Based on the findings, the respondents provide positive feedback and comment towards integration of mobile technology in the teaching and learning process, and believe that this integration enables change in the classroom environment to become more enjoyable and interesting.

*Respondent 1*

"I feel it is helpful because if we have the tablet we can easily show examples to the students but there is a problem, whereby tablets cannot be provided to all the students and the screen is too small."

*Respondent 2*

"I think it will be more attractive because the mobile device can be used outside the school hour also."

*Respondent 3*

"I feel it is useful and interesting because it is a new teaching method and students will enjoy the dynamic teaching material. The provided has only text and statics images. Therefore, when integrated with new technology, the students will understand the topic better."

*Respondent 4*

"Of course. Mobile device is portable and I can bring to the field and show the video to the students immediately Compared to laptop, the size of the laptop is bigger and the mobility is low."

From all the conversation above shows that teachers interested and totally agreed when the physical education class also followed the new trends which is using mobile device to teach students. This is because the characteristic of the mobile device provides benefit in teaching physical education during indoor and outdoor activities. According to Economides and Nikolaou (2006), the mobile device characteristic can be categorized into three; usability, technical and functional. Mobile device should be fully utilized in teaching physical education because it is easy to use. Mobile device is also easy to carry, especially as the teachers need to show video clips to the students related to sport skills or recording



real-time observation (Melhuish, Falloon and Melhuish, 2010). For technical aspect, mobile device has the ability to display different format of video or image. Importantly, mobile device is able to install and run several software that are developed for teaching physical education purpose. The mobile device that used in teaching and learning process should have good performance, connectivity and compatibility to make the teaching process more effective. The function of the mobile device is also an important factor in implementing M-Learning in classroom. The mobile device should have the function of communications, information replay and organization of data. These functions allow the teachers to download the video or animation which help in the teaching process. Besides that, mobile device also need to have the function of play audio and video, as teachers may need it for the observation or assessment on students' performance.

Furthermore, the use of mobile learning is very convenience for the teachers and students because they can teach or learn from different location and environment (Kukulska Hulme and Sharples, 2009). The learners are able to create their own learning environment at anytime and anywhere. The connectivity of mobile device also enable teachers and students to share the information immediately although they are far away from each other. A study mentioned that, the nature of mobile learning is related with the theory of constructivism (Fraga, 2011). The theory of constructivism by Piaget (1950) is aligned with the pattern of mobile learning because Piaget (1950) mentioned that learner constructs their own knowledge by looking for meaning in new situation. When implement mobile learning in teaching and learning process, the students able to generate new knowledge which is discovered in problem solving situation. Mobile learning is suitable to be used in teaching and learning physical education because the audio video or mobile application illustrates other multimedia elements beside text. The students may learn the sport skills by following the instruction in the video or mobile application. The students also can record the posture and replay the video to identify correct posture. From the "try and error" process, they can generate new knowledge on physical activities

Since mobile device have various function, students may depict improved behavior and effort in learning physical education because the information of textbook is changed into digital medium. It is considered a new teaching method and may enhance their interest and attention when teachers are teaching by using mobile device. The teachers also can save a lot of time to prepare teaching material to show to the students during the physical education class. Teachers can find the teaching material from internet in various forms, such as video, animation, image and audio. Comparing between the traditional teaching methods, new teaching method may be less time consuming. Therefore, a mobile application should be developed in order to change the textbook into a digital form.

## 7. CONCLUSION

This paper illustrates the thematic analysis of interview data which was conducted by the researcher with four respondents. Based on the findings, three issues and a suggestion are identified; time factor in physical education class, teaching method, students' perception toward physical education and future trend in physical education. The teachers have to teach the entire physical education subject syllabus that is designed in limited time. The pace of teaching has to be increased, so the teachers can complete the task at the end of the year. Unfortunately, the teachers still use the traditional teaching method and a lot of time is used in dissemination of knowledge. Hence, the students are unable to adapt the teaching pace of this subject. The students also show less interest and does not focus during the lesson in the classroom as some topics is quite complicated to understand such as cardiovascular system or muscular system. Besides that, it was noted that the students purposely do not bring the physical education textbook to school. To overcome this problem, new teaching method need to be implemented to change the classroom environment during physical education lesson. Thus, encourage and motivate the students' behavior and effort in learning this subject. Currently, mobile learning is a trend and previous studies show that mobile learning enables to change the classroom environment. Mobile learning also aligned with the learning theory of constructivism which is suitable to implement in learning sport skills by discovering new knowledge from "try and error" process. The researcher suggests that a digital application should be developed and included the multimedia elements that can attract and encourage students' interest to further study in this subject.

### *Acknowledgement*

The authors would like to thank the Universiti Teknologi Malaysia and Ministry of Higher Education Malaysia for their support in making this project possible. This work was supported by the Research University Grant (R.J130000.7731.4J132) initiated by the Universiti Teknologi Malaysia and Ministry of Higher Education.

### *References*

- Bailey, R. (2005). Evaluating the relationship between physical education, sport and social inclusion. Routledge, 37–41.
- Bailey, R. (2006). Physical education and sport in schools: A review of benefits and outcomes. *Journal of School Health*, 76(8), 397–401.
- Barber, B. L., Eccles, J. S., and Stone, M. R. (2001). Whatever happened to the brain drain? *Engineering and Technology*, 3, 82.
- Blanchard, C. M., Mask, L., Vallerand, R. J., Sablonnière, R., and Provencher, P. (2007). Reciprocal relationships between contextual and situational motivation in a sport setting. *Psychology of Sport and Exercise*, 8(5), 854–873.

- Cantillon, P. (2003). Teaching large groups helping students to learn in lectures. *British Medical Journal*, 326(7386), 437–440.
- Chiong, C., and Shuler, C. (2010). Learning: Is there an app for that? Investigations of young children's usage and learning with mobile devices and apps. The Joan Ganz Cooney Center at Sesame Workshop, 34. Retrieved from [cooney.center@sesameworkshop.org](mailto:cooney.center@sesameworkshop.org)
- Cloes, M. (2005). Research on the students' motivation in physical education. *The Art and Science of Teaching in Physical Education and Sport*, 197–210.
- Coe, D. P., Pivarnik, J. M., Womack, C. J., Reeves, M. J., and Malina, R. M. (2006). Effect of physical education and activity levels on academic achievement in children. *Medicine and Science in Sports and Exercise*, 38, 1515–1519.
- Conejar, R. J., and Kim, H. (2014). The Effect of the Future Mobile Learning/ : Current State and Future Opportunities. *International Journal of Software Engineering and Its Applications*, 8(8), 193–200.
- Dewey, J. (1913). *Interest and Effort in Education*. Boston, MA: Riverside Press.
- Dwyer, T., Sallis, J. F., Blizzard, L., Lazarus, R., and Dean, K. (2001). Relation of Academic Performance to Physical Activity and Fitness in Children. *Pediatric Exercise Science*, 13, 225–237.
- Economides, A. A, and Nikolaou, N. (2006). Evaluation of Handheld Devices for Mobile Learning. *International Journal of Engineering Education*, 24(1), 1–21.
- Falloon, G. (2013). Young students using iPads: App design and content influences on their learning pathways. *Computers and Education*, 68, 505–521.
- Fraga, L. M. (2011). Mobile Learning In Higher Education. In I. A. Sanchez and P. Isaias (Eds.), *Mobile Learning* (pp. 333–337). Avila, Spain: International Association for Development of the Information society.
- Hashemi, M., Azizinezhad, M., Najafi, V., and Nesari, A. J. (2011). What is mobile learning? Challenges and capabilities. *Procedia - Social and Behavioral Sciences*, 30, 2477–2481.
- Indiana Standards. (2000). Standards - What are they? How are standards to be used? Standards at the National Level. Retrieved from [http://www1.ccs.k12.in.us/uploads/attachments/0000/1349/physical\\_education\\_standards.pdf](http://www1.ccs.k12.in.us/uploads/attachments/0000/1349/physical_education_standards.pdf)
- Irby, D. M., and Wilkerson, L. (2008). Teaching when time is limited. *BMJ: British Medical Journal*, 336(7640), 384–387.
- Keengwe, J., and Bhargava, M. (2014). Mobile learning and integration of mobile technologies in education. *Education and Information Technologies*, 19(4), 737–746.
- Kim, S. H., Mims, C., and Holmes, K. P. (2006). An Introduction to Current Trends and Benefits of Mobile Wireless Technology Use in Higher Education. *Association for the Advancement of Computing in Education (AACE)*, 14(1), 77–100.
- Kretschmann, R. (2014). Student Motivation in Physical Education- The Evidence in a Nutshell. *Acta Kinesiologica*, 8(1), 27–32.
- Kukulska Hulme, A., and Sharples, M. (2009). Mobile and contextual learning. *Alt-J*, 17(3), 159–160.
- Lee Boon Kiat (2014). Teachers' and Students' Perceptions of Information, Navigation and Interface Design of Multimedia Courseware for Teaching and Learning Volleyball Skills. *Universiti Teknologi Malaysia*.

- Lee Boon Kiat, Noor Dayana, and Halijah. (2015). Issues and Future Trends in Teaching Physical Education: A Preliminary Study. IEEE Conference on E-Learning, E-Management and E-Services, 75-80.
- Lee Boon Kiat, Noor Dayana, and Halijah. (2015). Students' Perceptions towards Information, Navigation and Interface Design of Volleyball Learning Courseware. International Colloquium on Sports Science, Exercise, Engineering and Technology, 281-289.
- Lerikkanen, M. K., Kiuru, N., Pakarinen, E., Viljaranta, J., Poikkeus, A., Rasku-Puttonen, H., ...Nurmi, J. E. (2012). The role of teaching practices in the development of children's interest in reading and mathematics in kindergarten. *Contemporary Educational Psychology*, 37(4), 266–279.
- Lu, Z., and Deng, X. (2014). Teaching Adaptability, Teaching Approach Preference and Learning Interest: Evidence from Freshman in Sichuan University, China. *Asian Social Science*, 10(7), 29–37.
- Martin, S., Diaz, G., Sancristobal, E., Gil, R., Castro, M., and Peire, J. (2011). New technology trends in education: Seven years of forecasts and convergence. *Computers and Education*, 57(3), 1893–1906.
- Masats, D., and Dooly, M. (2011). Rethinking the use of video in teacher education/ : A holistic approach. *Teaching and Teacher Education*, 27(7), 1151–1162.
- Melhuish, M., Falloon, G., and Melhuish, K. (2010). Looking to the future: M-learning with the iPad. *Computers in New Zealand Schools Learning Leading Technology*, 22(3), 1–16.
- Ministry of Education Malaysia. (2002). Syllabus of Physical Education For Primary and Secondary School. Retrieved from [http://apps2.moe.gov.my/kurikulum/kbsr\\_kbsm/hsp/p\\_jasmani/hsp\\_pj\\_kbsm.pdf](http://apps2.moe.gov.my/kurikulum/kbsr_kbsm/hsp/p_jasmani/hsp_pj_kbsm.pdf).
- Mulig, L., and Rhame, S. (2012). Time Requirements in an Online Teaching Environment: How to be More Effective and Efficient in Teaching Online. *Journal of Accounting and Finance* (2158-3625), 12(4), 101–109.
- National Standards for Physical Education. (2013). NASPE Resource Brief - Quality Physical Education. Retrieved from <http://www.shapeamerica.org/advocacy/resources/upload/resource-brief-QPE.pdf>
- Pannabecker, J. R. (1995). For a History of Technology Education/ : Contexts , Systems , and Narratives. *Journal of Technology Education*, 7(1), 43–56.
- Pate, R. R., O'Neill, J. R., and McIver, K. L. (2011). Physical Activity and Health: Does Physical Education Matter? *Quest*, 63(19–35).
- Piaget, J. (1950). *The psychology of intelligence*. London: Routledge and Paul.
- Shariffudin, R. S., Mislán, N., Wong, C. K., and Julia, G. C. H. (2011). Teaching Psychomotor Skills with E-Sports Courseware, 1(4).
- Shephard, R. J. (2012). The association between school-based physical activity, including physical education, and academic performance: A systematic review of the literature. *Yearbook of Sports Medicine*, 358–359.
- Steel, C., Springett, R. and Kirk, M. (2012). Fitting learning into life: Language students' perspectives on benefits of using mobile apps. *ascilite2012 Conference Proceedings*, (875-880).

- Telstra. (2011). FACT SHEET/ : Telstra Smartphone Index Highlights, 1–5.
- Wang, D. (2011). The dilemma of time: Student-centered teaching in the rural classroom in China. *Teaching and Teacher Education*, 27(1), 157–164.
- Williams, H. G., Pfeiffer, K. A., O’Neill, J. R., Dowda, M., McIver, K. L., Brown, W. H., and Pate, R. R. (2008). Motor skill performance and physical activity in preschool children. *Obesity (Silver Spring, Md.)*, 16(6), 1421–1426.
- Xu, F., and Liu, W. (2013). A Review of Middle School Students’ Attitudes Toward Physical Activity. *The Dimensions of Physical Education*, 284–295.