

IMPLEMENTATION OF DIGITAL MEDIA IN PHYSICAL EDUCATION SUPERVISION: THE CHALLENGE OF PHYSICAL EDUCATION SUPERVISION IN INDUSTRIAL REVOLUTION 4.0

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ABSTRACT

This paper discusses the importance of digital media for conducting physical education supervision. The coming of twenty first century in which digital media colors the education suggests that the education supervision should be shifted from the old to the new paradigm. Digital media in physical education supervision such as using Facebook and WhatsApp is a very important innovation in the dynamics of education for answering the challenges of industrial revolution 4.0. Through multimedia technology, the task of physical education supervisors in carrying out their duties are maximized.

Keywords: *Physical education, e-supervision, and industrial revolution 4.0*

INTRODUCTION

The history of industrial revolution (IR) sees the evolution of industrial revolution, starting with IR 1.0 which is characterized by the mechanization of production to support the effectiveness and efficiency of human activities, moving to IR 2.0 which is characterized by mass production and quality standardization. IR 3.0 on the other hand, is based on mass adjustments and automation and robot-based manufacturing flexibility and finally, IR 4.0 comes to replace Industry 3.0 which is characterized by physical cyber and manufacturing collaboration (Hermann et al., 2015; Irianto, 2017).

Lee, Lapira, Bagheri, and Kao (2013) explained that IR 4.0 evolved due to an increase in manufacturing digitalization which is driven by four factors: 1) increasing data volume, computing power, and connectivity; 2) the emergence of analysis, ability and business intelligence; 3) the occurrence of new forms of interaction between humans and machines; and 4) improvement of digital transfer instructions to the physical world, such as robotics and 3D printing. The term IR 4.0 itself was officially introduced in Germany at the Hannover Fair held in 2011 (Kagermann et al., 2011). Germany has a great interest in this matter since Industry 4.0 is part of its development plan policy called High-Tech Strategy 2020. The policy aims to ensure that Germany becomes the leading country in the manufacturing world (Heng, 2013). Several other countries also participate in realizing the 4.0 Industry concept, but use different terms such as Smart Factories, Industrial Internet of Things, Smart Industry, or Advanced Manufacturing. Despite having different terms, they all have the same goal of increasing industrial competitiveness in each country. This occurs because of the rapid development of the use of digital technology in various fields. Likewise, industrial revolution 4.0 which is based on cyber, fast information, large databases where technology increasingly dominates human activities and the internet world which combined with a variety of human activities, are increasingly needed, human ability to adapt to the logic of industry change 4.0 is required in order to meet those demands.

Industrial 4.0 Revolution and Education

The impact of industry on education is felt by many developing countries such as Indonesia. Since the beginning of the industrial revolution, the world of education has been directly affected. Industries urge educational institutions to follow this need. In other words, educational institutions must be able to provide human resources in accordance with industry changes. As such, learning methods are demanded to be dynamic and have to be in accordance with the industrial needs. Thus, the process of education supervision must also anticipate changes in the industrial revolution.

Information and Communication Technology (ICT) is vital for almost every organization, including educational institutions. Through this

technology, a lot of jobs can be conducted more efficiently and effectively. In line with this development, the Minister of Education of the Republic of Indonesia, Muhadjir Effendy stated that the presence of revolution 4.0 needs to be anticipated by the revision of the curriculum through the addition of five competencies which can be explained as follows: 1) Students have the ability to think critically, 2) Students have creativity and have innovative abilities, 3) Students have the ability and skills in communicating, 4) They have the ability to work together 5) Students have confidence (Republika.co.id, May 2 2018). What is meant is that there must be a driving force for Indonesian teachers to be creative, innovative and be collaborative, apart from having self-confidence abilities. In this case, the teaching and learning process carried out by the teachers must follow this change. Thus, teachers must master information technology skills. Teachers are encouraged to utilize information technology in the activities of the teaching and learning process.

The 21st century has strong characteristics, namely characterized by the existence of information technology that is used massively by the community. The Ministry of Education and Culture of Indonesia formulated that the 21st century learning paradigm emphasizes the ability of students to learn and research from various sources, formulate problems, think analytically and collaborate in solving problems. The 21st century learning framework according to Wijaya, et al. (2016) is: follows:

- 1) Critical-Thinking and Problem-Solving Skills. This is related to the ability to think critically, laterally, and systemically, especially in the context of problem solving;
- 2) The ability to communicate and cooperate (Communication and Collaboration Skills). This is related to the ability to communicate and collaborate effectively with various parties;
- 3) Critical-Thinking and Problem-Solving Skills. This is related to the ability to think critically, laterally, and systemically, especially in the context of problem solving;
- 4) The ability to communicate and cooperate (Communication and Collaboration Skills). This is related to the ability to communicate and collaborate effectively with various parties;

- 5) Ability to create and update (Creativity and Innovation Skills). This is related to the ability to develop their creativity to produce innovative breakthroughs;
- 6) Information and communication technology literacy. It is about the ability to use information and communication technology to improve performance and daily activities;
- 7) Contextual Learning Skills. It is about the ability to undergo contextual independent learning activities as part of personal development; and
- 8) Information capability and media literacy. This is related to the ability to understand and use various communication media to convey various ideas and carry out collaborative activities and interaction with various parties.

Innovation in Physical Education Supervision

Supervision must also undergo changes. Supervision behavior is influenced by political (policy) system, social, religious and industrial forces. Monitoring practices need to be improved in the era of industrial revolution based on information and communication technology. This requires innovation skills regarding new ways of monitoring, controlling, advising and guiding the entire school community. Neagley and Evans (1980) state that modern supervision consists of positive, dynamic and democratic actions designed to enhance the development of all parties: children, teachers, supervisors, administrators, and other parents or laymen. Effective and appropriate monitoring of interactive monitoring models needs to be developed. In this case, the idea of e-supervision needs to be considered. E-supervision offers supervisors new, innovative way of working with supervisees in a geographically distant place. In light with this phenomenon, particularly in the era of information technology as it is today, which is full of openness, supervision models that seem authoritarian and closed are no longer appropriate. E-supervision needs to be considered as a virtual supervision of supervisors connected with scattered organizations as suggested by Samuel (2006) who practiced virtual supervision with his engineering graduate students.

The supervision approach taken should refer to the problems experienced by the teacher in the learning process. Physical education

teachers are also indistinguishable from other teachers. Being a professional physical education teacher is not as easy as one might imagine. Physical education teachers must be active, creative, effective, fun and innovative. Physical education teachers are teachers who are accustomed to teaching outside the classroom because the material taught is more practical. But problems sometimes occur when physical education teachers teach in the classroom. The lack of mastery in classroom management and the lack of effective lecture method used in delivering the material made students less focused on receiving the materials presented. Therefore, in order to improve classroom management competencies of physical education teachers, supervisors need to carry out a more appropriate, structured supervision to help physical education teachers in solving their problems. E-supervision will provide a better way of supervision (Gary, 1998). The supervisor and supervisees' review can be formulated as follows:

- 1) Having the skill to navigate in an online manner
- 2) Having basic typing and spelling skill;
- 3) Being able to express themselves in written words;
- 4) Being able to express concepts/ideas without using non-verbal cues;
- 5) Having excellent communication skill.

E-supervision can provide several benefits. These benefits are related to the use of technical resources, coordination between supervisors and supervisees, and better management. The following are some of the benefits that can be obtained through the e-supervision model (Albar, 2012):

- 1) Simplicity. E-supervision is a simple and easy process for those who are familiar with the internet as an interaction tool and for those who have good typing skills;
- 2) Comfort. E-supervision is carried out in the comfort of one's home or office. There are no trips involved;
- 3) Ease of expression. Some problems are easier to express in online manner than face to face;
- 4) Potential effectiveness of time and money. In addition to reducing costs, this also reduces the amount of supervision and the amount of travel costs so that it can help other administrative

- tasks. This is because supervisors can schedule several teacher supervision sessions per day;
- 5) Quick and sustainable access to information. This is easier for supervisors, teachers, and other employees to check information by clicking the button;
 - 6) Better management. The e-supervision facility becomes a process in information management;
 - 7) Individual time in communication. Everyone needs as much time as needed to answer questions, write problems, and give feedback.

Digital Media in Physical Education Supervision Process

The educational process in our schools has shown rapid development in the fields of curriculum, learning methodology, equipment and assessment. In addition, there have been changes in the fields of education administration, organization, personnel [HR], and education supervision. Overall, the changes that occur are reforms in the education system that concern all aspects or components that exist. These changes are very much related to information technology. At present, there are many forms of technology that can be utilized in conducting supervision activities. One of them is digital-based supervision. Digital technology is a technology that no longer uses human or manual power, but tends to be based on an automatic operating system through a computerized system or computer-readable format. The existence of digital technology gives rise to virtual space and it makes it possible to do all kinds of activities to get information. This is used for application in developing educational learning methods with interactive learning methods. The use of digital technology and social media is not only within the scope of association, but also as a support in the learning process. This is very appropriate for students and supervisors (Sulisworo, 2013). Through interactive technology-based digital supervision methods, teachers can use online networks and social media to make contact with other schools and friends which could help them adapt to the practice of teaching and exchanging information. Students can use digital technology to communicate with other students and teachers so that they can be involved in the learning process independently and in groups.

Digital technology in the communication perspective is an efficient delivery system. Communication becomes more dynamic without being hindered by time and space. Examples and benefits of digital technology in community life can be seen from the communication carried out using an internet intermediary. There are various internet applications that provide video call or chat facilities to create two-way communication between supervisors and supervisees (Muhasim, 2017).

Through interactive technology-based digital supervision methods, teachers can use online networks and social media to connect with other schools and with colleagues who can help them adapt to the practice of teaching and exchanging information, while students can use digital technology to connect with other students or teachers to engage in both independent and group learning.

In addition, the role of mobile technology in learning is also increasingly high in Indonesia (Sulisworo & Toifur, 2016). This technology can also be used in the physical education supervision process. Technically, this can be presented in the form of multimedia based on digital (digital-based), for example, computers, cellphones, and others. Etymologically, multimedia comes from the Latin language, which is from the word “multi” meaning many, various, and medium that comes from something used to convey or bring something. Multimedia is a combination of various media (file format) in the form of text, images, audio, and interaction. This is used to convey messages/information from the sender to the recipient of the message/information. Today many teachers and students have smart phones (smart phones) with multimedia applications, social media that can be used to connect with various parties. The majority already have smartphones that can be used in this (digital) internet-based supervision process. Through social media, Facebook, YouTube, WhatsApp and others, supervisors can communicate in real time with teachers and students. Through virtual-based supervision, a supervisor in one place can control many teachers in different places. Therefore, collaboration between supervisors and teachers through online discussions is expected to produce many studies to improve the quality of learning. Whatsapp, for example can be used in digital-based supervision media.

The benefits of *Whatsapp* are as follows:

- 1) The existence of whatsapp groups are controlled by supervisors and consists of teachers. Through this group, all information from the supervisor can be obtained quickly. Some learning materials, policies, and so on can be divided into groups and can be read in real time by members. The teachers can directly report various activities carried out, accompanied by several photos or videos from the location of the teacher, teaching;
- 2) Through whatsapp, the teacher can send activities that have been recorded both in the form of photos and videos. This can then be assessed by the supervisor;
- 3) The teacher can record the learning process in class and in the field that is broadcast in real time. This means that the supervisor can control it at any time through this media as if being present at the location.

Whatsapp is one of the social media which is currently used for the benefit of both socializing and as a message for individuals and groups. WhatsApp Messenger is part of social media. WhatsApp Messenger has a Whatsapp Group that is able to build a fun learning related to various discussion topics provided by the teacher. The existence of WhatsApp Messenger is inseparable from the existence of Net Gen or the digital generation that always wants to update various internet-based technologies. The latest empirical data shows that Net Gen has a collaborative learning tendency, does not have a good response to lecture learning methods, wants information they can receive individually, and always wants various kinds of learning materials that can be accessed easily through technology tools. WA Group allows its users to deliver certain announcements, share ideas and learning resources, and support online discussions. Rembe and Bere (2013) revealed that the Whatsapp Messenger application was able to increase the participation of students, accelerating the occurrence of learning groups in building and developing knowledge.

Learning with the help of online applications such as WhatsApp Messenger can enhance collaboration in learning, sharing knowledge and information that is useful in the learning process and maintain the pleasures of learning throughout time. Here are the benefits of using the Whatsapp Messenger Group Application in learning:

- 1) Whatsapp Messenger Group provides collaborative and collaborative learning facilities online between teachers and students or fellow students both at home and at school;
- 2) Whatsapp Messenger Group is a free application that is easy to use;
- 3) Whatsapp Messenger Group can be used to share comments, posts, pictures, videos, sounds, and documents;
- 4) Whatsapp Messenger Group provides convenience to disseminate announcements and publish their work in groups;
- 5) Information and knowledge can be easily created and disseminated through the features of Whatsapp Messenger Group (Barhomi, 2015).

It is felt that educational supervision based on learning process activities in schools can follow the trend of using Whatsapp in education supervision. A study conducted by Jumiatmoko (2016) proposed several benefits of Whatsapp application, namely:

- 1) WhatsApp Messenger is an internet-based Instant Messaging application with a number of users that has increased since the last three (3) years. The increase is coupled with the length of duration of use and fast understanding of WhatsApp Messenger usage and features;
- 2) WhatsApp Messenger provides an opportunity for anyone, including the academic community, to organize various online systems based on virtual classes and multimedia features without limitation of time and space;
- 3) WhatsApp Messenger adapts to the social culture of its users without reducing the quantity, quality, and modernity of the way to communicate.

Based on these conclusions, the WhatsApp Messenger Group can be used as a learning innovation for a group of students, a group of teachers or lecturers with a group of students, teachers or lecturers with a group of students, as well as a teacher or lecturer with a group of parents of students involved in one forum to discuss, share information, or just share the spirit of learning. What can be reflected on this issue is that e-supervision can bring about many benefits for both supervisors and supervisees. Firstly, the supervisor is involved in a group of teachers

and students. This activity presupposes that the teacher and students in the class already use the Whatsapp group to communicate and interact. Teachers through existing groups could provide learning materials and information and at the same time, discuss with students various matters concerning Physical Education subjects. A supervisor can monitor this group and provide an assessment to the teachers, giving control, input so that the communication process goes well. What is produced in this group discussion is able to be applied in the practice of learning. Secondly, supervisors could form a Whatsapp group, especially with the teachers. In this group, various activities are carried out from the provision of new information, discussion of material, learning styles and so on. Through this group, teachers can update their class activities at the same time reported (real time) so that the supervisor can find out about the information directly. Through this group, teachers can share experiences in the learning process that are supported by photos, videos, and so on so that this makes it easier to understand what is being conveyed. This is not limited to space and time. Supervisors can also deliver instructions from superiors addressed to the teacher. Control can also be done through this group. One example is asking the teacher's position during certain hours and if reporting teaching in class, it can be asked to do a video call directly. Teacher teaching schedules can also be sent via Whatsapp so that supervisors can monitor when the teacher teaches. Through Whatsapp, supervisors can conduct supervision faster, on time and can be directly checked for the truth.

In addition, experience in Norway can also be a point of reference in the practice of learning supervision. This project uses tablets (iPad) in practice supervision. There are several steps agreed upon in its implementation (Mathisen, 2016).

- 1) Stage before learning. This stage is divided into what will be supervised, both students, teachers and supervisors;
- 2) During the learning process. Supervisors, students and participants record what has been determined during the learning process. This is done by recording, both audio, video, and writing notes;

- 3) Stage between learning and supervision. The supervisor collects records from all parties involved;
- 4) Supervision phase. Supervisors discuss notes, video recordings with teachers and students;
- 5) Stage after supervision. At this stage, all reflect together for improvement.

Another experience was highlighted by the Indiana University of Pennsylvania (IUP) where video conferencing to supervise students and teachers was carried out to overcome problems of distant locations. The IUP places student teachers in more than 150 school districts from Pittsburgh to Philadelphia and from Bedford to Erie, an area larger than 60,000 square miles. Overall, the IUP project director reported a summary statement of the effectiveness of video conference for the supervision of student teachers. Based on the report, they are very satisfied with this program:

- 1) Video conference for effective student teachers;
- 2) Video conference functions in all models and departments;
- 3) With minimal preparation, students and teachers work together and university supervisors can use videoconferencing in the supervision process;
- 4) The technology available today is sufficient to provide effective supervision for student teachers in remote locations;
- 5) Involvement in innovative programs and other availability can overcome small technical difficulties;
- 6) Equipment location cannot dictate the use, especially for students with special learning needs;
- 7) The need exists for carefully planned pre-training and orientation to the use of video conferencing to oversee students and teachers;
- 8) Human aspects of planning, scheduling, and conferencing are very important for the perceived quality of supervision rather than the technical aspects of using video conference equipment (Garrett & Dudt, 1998).

However, these advantages are not necessarily easy to be applied in the practice of education supervision. Apart from this, it is important

to consider various obstacles in implementing this digital-based education supervision, namely:

- 1) It is important to choose social networking media that are considered very appropriate and supportive. This can be single or mixed. Whatsapp, for instance, can be combined with other media, such as Youtube, Facebook, and so on. The selection of this social network is used to build interaction between teachers and supervisors;
- 2) Designing standard procedures in supervision becomes necessary in order to be able to carry out the operational functions;
- 3) Creating training for ICT-based teaching and learning processes also needs attention.

CONCLUSION

In conclusion, in the current educational context, the delivery of information and the interaction between the school communities cannot be limited to the implementation of conventional education which tends to be conducted via face-to-face approach. Industrial revolution 4.0 is characterized by the speed of information technology-based information which has changed many aspects of education and requires serious efforts in order to anticipate and face the challenges of this revolution. However, digital-based supervision still needs to be implemented particularly in the developing countries such as Indonesia. This is because, physical education is not only done in the classroom, but also in the field outside the classroom. As such, this requires information technology support to help the supervision process. One of them is through interactive education supervision based on information technology framework. E-supervision is a very important innovation in the dynamics of education. With the use of social media, such as Facebook, WhatsApp that can connect people from various locations, it is expected that the task of physical education supervisors particularly in Indonesia in carrying out their duties will be more efficient.

REFERENCES

- Albar, Adnan Mustafa. (2012). An electronic supervision system architecture in education environments. *European Journal of Business and Management*, 4(8), 2012.
- Barhomi, Choki. (2015). The effectiveness of *whatsapp* mobile learning activities guided by activity on students' knowledge management. *Contemporary Educational Technology*, 6(3), 221-238.
- Cano, Esteban Vázquez & García, M. Luisa Sevillano. (2013). ICT strategies and tools for the improvement of instructional supervision. the virtual supervision. *TOJET: The Turkish Online Journal of Educational Technology*, 12(1),77-87.
- Davies, R. (2015). Industry 4.0 digitalisation for productivity and growth. *European Parliamentary Research Service*, 1.
- Drath, R., & Horch, A. (2014). Industrie 4.0: Hit or hype? [industry forum]. *IEEE Industrial Electronics Magazine*, 8(2), 56-58.
- Gary, S. S. (1998). Online Supervision for Social Workers. ACSW, CSWR, CASAC, and Shavone Hamilton: CSW.
- Garrett, J. L. & Dudt, K. (1998). Using video conferencing to supervise student teaching, in electronic publication. Available at: http://www.coe.uh.edu/insite/elec_pub/HTML1998/tp_garr.htm.
- Heng, S. (2014). Industry 4.0: Upgrading of Germany's industrial capabilities on the horizon. <https://ssrn.com/abstract=2656608>. Diakses pada 17 Jun 2017.
- Hermann, M., Pentek, T., & Otto, B. (2016). Design principles for industrie 4.0 scenarios. *System Sciences (HICSS)*, 49th Hawaii International Conference, pp. 3928-3937.
- Herabudin. (2009). *Administrasi dan supervisi pendidikan*. Bandung: Pustaka Setia. [http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/568337/EPRS_BRI\(2015\)568337_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/568337/EPRS_BRI(2015)568337_EN.pdf).
- Irianto, D. (2017). Industry 4.0: The challenges of tomorrow. Disampaikan pada Seminar Nasional Teknik Industri, Batu-Malang.
- Jutta P., Maria J., Anna R., & Gunter V. (2006). How to use weblogs in e-supervision? FH JOANNEUM, ZML-Innovative Learning

- Scenarios and the Coordination Centre for International Activities.
- Kagermann, H., Lukas, W. D., & Wahlster, W. (2013). Final report: Recommendations for implementing the strategic initiative Industrie 4.0. *Industrie 4.0 Working Group*.
- Lee, E. A. (2008,). Cyber physical systems: Design challenges. In *Object Oriented Real-Time Distributed Computing (ISORC), 11th IEEE International Symposium*, pp. 363-369.
- Lee, J., Lapira, E., Bagheri, B., Kao, H., (2013). Recent advances and trends in predictive manufacturing systems in big data environment. *Manuf. Lett.*, 1(1), 38–41.
- Mathisen, P. (2016). Tablets as a digital tool in supervision of student teachers' practical training. *Nordic Journal of Digital Literacy*, 11(4), 227-247.
- Muhasim. (2017). Pengaruh teknologi digital terhadap motivasi belajar peserta didik. *Jurnal Studi Keislaman dan Ilmu Pendidikan*,5(2). November 2017.
- Neagley, R. L., & Evans, H. D. (1980). *Handbook for Effective Supervision of Instruction (3rd Ed.)*. Englewood Cliffs, N.J.: Prentice Hall.
- Republika.co.id, (2018). Mendikbud ungkap cara hadapi revolusi 4.0 di pendidikan. 2 Mei 2018.
- Rambe, P., & Bere, A. (2013). Using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology. *British Journal of Educational Technology*, 44(4), 544-561.
- Samuel Kinde Kassegne. (2006). Work in Progress: Lessons from Virtual Supervision of Engineering and Computer Science Graduate Students: Case of Addis Ababa University. *36th ASEE/IEEE Frontiers in Education Conference*.
- Sagala Syaiful. (2010). *Supervisi pembelajaran dalam profesi pendidikan*. Bandung: CV. Alvabet.
- Sweden, I. (2018). Mengenal 4 tahap perkembangan revolusi industri duni. <https://steemit.com/indonesia/@iqbalsweden/mengenal-4-tahap-perkembangan-revolusi-industri-dunia>
- Wijaya, Etistika Yuni, Dwi Agus Sudjimat, & Amat Nyoto. (2016). Transformasi pendidikan abad 21 sebagai tuntutan

pengembangan sumber daya manusia di era global. *Universitas Kanjuruhan Malang, 1.* – ISSN 2528-259X.

Wijasantosa, Ratal. (1984). *Supervisi pendidikan olahraga.* Jakarta: Universitas Indonesia (UI-PRESS).