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Zero waste through blended learning based learning for social studies education students in Malang State University

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Abstrak. Blended learning mampu mempromosikan pembelajaran yang ramah lingkungan, namun pada kenyataannya masih jarang digunakan secara masif karena kendala sarana atau kemampuan individu. Oleh karena itu fokus kajian dalam artikel ini adalah bagaimana peluang zero waste melalui pembelajaran berbasis blended learning untuk mahasiswa PIPS di Universitas Negeri Malang. Pendekatan kualitatif dengan desain deskriptif digunakan untuk membahas topik peluang blended learning dalam mempromosikan zero waste. Teknik pengumpulan data pada mahasiswa IPS menggunakan angket dan wawancara untuk melakukan triangulasi data. Implikasi dari temuan riset ini dapat menjadi dukungan pada kajian peluang pengembangan blended learning pada skala yang lebih luas dalam mempromosikan pembelajaran ramah lingkungan.

Abstract. Blended learning can promote a learning-friendly environment, but in reality, that method is rarely used on a massive scale because of constraints means or the ability of the individual. Therefore the focus of the study in this article is how zero waste through learning opportunities based PIPS blended learning for students at the State University of Malang. A qualitative approach with the descriptive design is used to discuss the topic of blended learning opportunities in promoting zero waste. Data collection techniques at IPS students using questionnaires and interviews to triangulate data. The implications of the findings of this research can be a support to the study of the development of blended learning opportunities on a broader scale in promoting a friendly learning environment.

Keywords. *Blended learning, Zero waste, learning-friendly environment*

1. INTRODUCTION

Conventional learning still uses paper as a worksheet. One of the places that have high waste production potential in a city is a college or university. The frequent use of paper in universities as worksheets can cause rubbish piles every day (Fadhilah, 2011). Waste generated from tertiary institutions is paper waste, which is usually used in collecting assignments, conducting examinations, even in doing a thesis. Paper is made through natural materials, namely fibers, and processed wood. The fact is that one pine tree can produce 80, 5 pounds of paper. When compared with the weight of copy paper, one ream of copy paperweights 5 pounds of paper with a total of 500 sheets of paper. With this calculation, you will get 8050 sheets of paper or about 16 reams produced from one pine tree trunk. If counted deeper, one ton of paper is equal to 200,000 sheets = 400 reams, then for 1 ton of paper requires 25 pine trees (Shaumi, Rahmawati 2018). This has not been calculated in units of months or even years. If every day in Indonesia discards about 9% of the total of 65 million tons, then the number will be 5,850 million tons of paper waste every day in Indonesia. Every day we kill 146.25 million pine trees. Only 9% of us have killed nearly 150 million trees.

All learning media currently available are made of paper. Starting from books, worksheets, even a collection of questions is made of paper (Student Worksheet). The average book or collection of questions is only used in a certain period and not reprocessed before it becomes garbage. Students are required to buy books as a guide and source of independent learning. Though these books are not used maximally, both by lecturers and students. Students even tend to use the internet to do assignments and understand the material. Not to mention the mandatory tasks to be printed with specific rules that make a waste of the amount of paper used. Such as margins with a size of 4,3,3,3. So how many trees have we killed to do these tasks even if they are not used to the full? Therefore, if not followed up, we can kill more trees to produce more paper

waste. Therefore learning methods are needed where we can create zero waste starting from the environment around us, especially in the scope of PIPS students of Malang State University.

The 4.0 industrial revolution appeared because of the development of increasingly sophisticated technological systems. Digitalization has entered in all fields of human life. One of them is the existence of Blended Learning. Blended learning is one of the innovative and environmentally friendly learning models. This learning is a combination of offline learning and online learning. This learning utilizes the use of the internet. Today, the internet not only connects people around the world but can also facilitate the daily lives of humanity. The more time is developing. It would be nice if human life also developed, especially in terms of waste management. As a developing country, Indonesia certainly has a reasonably large population. Waste generated is also very much. The increasing amount of waste today is caused by population levels and lifestyle standards, namely, the more advanced and prosperous a person's life, the higher the amount of waste produced (El Hagggar, 2007). The existence of blended learning can minimize the use of paper in learning.

2. METHOD

Basically, this article is intended to discuss and find out the extent to which blended learning can reduce paper waste to create zero waste. A qualitative approach with the descriptive design is used to discuss the topic of blended learning opportunities in promoting zero waste. Data collection techniques for social studies students used questionnaires and interviews to triangulate data. Facts and data available and looking for alternative solutions to problems that are by describing efforts in reducing actual paper waste. Secondary data is used as support from scientific journals and previous research relating to blended learning and zero waste. The implications of the findings of this research can be support for the study of development opportunities for blended learning on a broader scale in promoting environmentally friendly learning.

3. RESULTS & DISCUSSION

The development of civilization will affect human life. Although it has a bad side to human life, the development of this era also harms the nature around us. For example, we are currently in the industrial revolution of 4.0. Everything is done instantly. Starting from transportation, food, and others. In the case of ordering food, we can order via the online application.

Nevertheless, what is often not paid attention to is the rubbish that results from these actions. In addition to plastic waste, paper waste is no less dangerous compared to plastic waste. Because the essential ingredients of making paper are tree fibers. This wood fiber can be divided into two, namely, young wood fiber and old wood fiber. The young wood fiber produced is usually derived from pine wood and eucalyptus which are approximately five years old. This wood fiber will be processed and will become paper. Unfortunately, many of these papers end up being junk and are not processed before they are discarded so that it becomes garbage and will decompose within a period of two to six months.

Zero waste is one way to reduce waste. The first time the term zero waste emerged through the company name is Zero Waste System Inc. Paul Palmer founded the company with the initial aim of minimizing the influence of the chemical industry on the surrounding environment. In the following years, zero waste began to be recognized, and the concept of zero waste began to be applied in the global community to reduce waste generation. The concept of zero waste itself reduces waste using 5R, namely Refuse, Reduce, Reuse, Recycle & Rot. The point of this process is about preventing the formation of rubbish, and if it becomes rubbish, it can be processed before everything is disposed of in a landfill or landfill. The actual concept can be applied in learning. Precisely, to students by involving students to implement a zero-waste system within the scope of learning. One simple example is to reduce the use of paper in teaching and learning activities. In this case, the blended learning method can be used as an alternative in covering zero waste. The reason for choosing blended learning as a learning method to unlock zero waste is because this learning can be accessed using the internet, so it benefits both parties between lecturers and students. Besides, the cost is also affordable and can also reduce paper usage.

The development of technology and information is very influential in everyday life. In the world of education, technological development is very influential. The education system, which was initially only

limited to face to face now switches to learning systems that use the internet network. One that is familiar to us to hear the term blended learning. Actually, the State University of Malang has implemented a blended learning system since 2016. However, the application has not been maximized.

Blended learning itself is a learning process that combines face-to-face learning with online learning. The main reason for choosing a blended learning method is that it can improve cost-effectiveness and can also create environmentally friendly learning. Blended learning can also be developed through existing media. We only need to use and develop existing technology. Some of the technologies that already exist and can be utilized are Google Class-room, all forms of Microsoft, Quiz, and Edmodo.

Malang State University provides SIPEJAR (Online Learning System) as environmentally-friendly online learning. Lecturers can use SIPEJAR as an effective online learning media. SIPEJAR can store lecture material, collect assignments, and lecture discussions online.

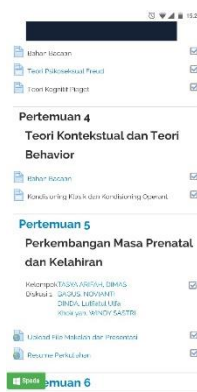


Figure 1. SIPEJAR (Online Learning System)

The trial we did by doing blended learning proved to have a positive response by students. Students consider online learning to help speed up the data collection process and reduce the costs generated by printing assignments on paper. Minimizing the use of paper is the primary goal of blended learning in achieving zero waste. Conventional learning is considered less useful when using paper as a learning medium. It can be taken for example, in one class of 2018 PIPS totaling 38 people. If when carrying out the final semester exams, usually, each student needs approximately two sheets of folio paper to do the exam questions. Then the number 76 will appear for one course, not the other courses. Imagine if an exam can be based online, it can reduce the amount of paper waste caused. For example, we can use the Quiz application to take the final semester exams or even use the Google Classroom application to collect the results of the test. If it is indeed forced to use paper, then at least before being disposed of the paper waste can be processed first. For example, it is being recycled to become a work of art that can be valuable so that it can produce a sale value.

4. CONCLUSION

Good learning does not only prioritize the quality of education but must pay attention to the impacts caused. Environmental sustainability, which is getting rid of for the sake of progress, must immediately be stopped. Blended learning uses a combination of offline and online in order to create learning by using technology as an effort to reduce the use of paper for environmental sustainability and achieve zero waste. Learning gives students the value of the importance of competence without forgetting environmental sustainability. Blended learning can be used as an alternative in order to realize zero waste, especially in the scope of higher education. Blended learning is used for reasons other than being effective, beneficial to both parties, and it can also reduce the amount of paper waste spent on student learning activities. Also, the use of blended learning as a learning method can take advantage of technological and information advancements, especially in the internet field. This will benefit all parties, where the next generation will not stutter about the development of information technology.

REFERENCES

Book:

El Haggag, Salah. (2007). *Sustainable Industrial Design and Waste Management*. Elsevier Academic Press: United States of America

Zed, Mastika, 2008. *Metode Penelitian kepustakaan*, Jakarta: Yayasan Obor Indonesia

Article in journal:

Christianson, R. G., & Fisher, K. M. (1999). Comparison of student learning about diffusion and osmosis in constructivist and traditional classrooms. *International Journal of Science Education*, 21, 687–698

Hennessy, S., Twigger, D., Driver, R., O’Shea, T., O’Malley, C. E., Byard, M., Draper, S., Hartley, R., Mohamed, R., & Scanlon, E. (1995). A classroom intervention using a computer-augmented curriculum for mechanics. *International Journal of Science Education*, 17, 189–206.

Khatibah. 2011. Penelitian Kepustakaan. *Jurnal Iqra*” Volume 05 no.1 halaman 35-39.

Prsetyo Hoedi, dkk. 2018. Industri 4.0: Telaah Klasifikasi Aspek Dan Arah Perkembangan Riset. *J@ti Undip: Jurnal Teknik Industri*, Vol. 13, No. 1, Januari 2018

Purnomo A, Ratnawati N, Aristin NF. Pengembangan Pembelajaran *Blended learning* Pada Generasi Z. *Jurnal Teori dan Praksis Pembelajaran IPS*. 2016 Jun 20;1(1):70-6.

Ritchie, S. M. (1998). The teacher’s role in the transformation of students’ understanding. *Research in Science Education*, 28, 169–185

Sanchez Briandie dkk. 2015. Analisis Finansial Sampah Kertas di Universitas Brawijaya. *Jurnal Sumberdaya Alam dan Lingkungan*

Sholikah S, Herumurti W. Timbulan dan Reduksi Sampah di Kecamatan Sukun Kota Malang. *Jurnal Teknik ITS* Vol. 6, No. 2 (2017), 2337-3520 (2301-928X Print)

Wahyono Sri. 2001. Pengelolaan Sampah Kertas di Indonesia. *Jurnal Teknologi Lingkungan*, Vol. 2 No. 3, September 2001: 276 – 280

Widiarti IW. 2012. Pengelolaan Sampah Berbasis “Zero Waste” Skala Rumah Tangga Secara Mandiri. *Jurnal Sains dan Teknologi Lingkungan* Volume 4, Nomor 2, Juni 2012, halaman 101-113 ISSN:2085-1227.

Proceeding/conference:

Chaeruman UA. Merancang *Blended learning* yang Membelajarkan. Disampaikan dalam Seminar Nasional dan Kongres Alumni dengan tema ”Meningkatkan Kualitas Pembelajaran Melalui Penggunaan Sumber-Sumber dan Teknologi yang tepat”, Universitas Negeri Sebelas Maret, Solo, 28 Nopember 2013