Utilization of Blended Learning Strategies Combined With Content Area Literacy to Improve The Capabilities of Writing Scientific Works at University

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ABSTRACT

The facts show that the culture of students’ literacy, including the culture of writing scientific papers, is low. Therefore, it is necessary to improve the culture of student literacy. One of them is by utilizing blended learning strategy combined with content area literacy to improve the ability to write scientific papers. This blended learning strategy allows students to read, write, and develop critical thinking combined with the use of communication and information technology that is characteristic of activity in the current era of technology. A blended learning strategy is done by assigning students to write scientific papers, while the content area literacy is done by deepening the substantive aspects of the topic of written scientific papers. When the course of writing scientific papers took place, students follow lectures face to face and combined with learning face-to-face (virtual learning). This learning brings advantages such as giving students the opportunity to work and consult scientific papers written anytime and anywhere.

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INTRODUCTION

The development of human life continues to happen from time to time. Staron et al (2010:3) divide the development of human life into five major phases, namely the nomadic era (160,000 BC), the agricultural era (10,000 BC), the industrial era (the 17th century), the information era (the 20th century) and the knowledge era (the 21st century) (Staron et al, 2010:3). Based on this division, currently, we are living in the knowledge era. This era has an implication for the need of adequate literacy culture (Kalantzis & Cope, 2015) as the humans living in this era must be equipped with sufficient knowledge in order to survive. In the knowledge era, people no longer sell goods or services, but knowledge itself (Staron, 2011).

Knowledge era is characterized by the rapid development of information and communication technology (ICT). This ICT development affects virtually all lines of life, including the world of education (Chui, 2015). It is evident as today, for example, students at the school are adept at using electronic devices, leading to the commonplace presentation of instructional media in electronic form (Scontras et al, 2014). In addition, thanks to the ICT development, students are now more “active” and engaged in a myriad of communication events, for example communicating with others remotely or making use of social media for discussing. Kalantzis & Cope (2015) refer to such generation of students as Generation P (participatory).

Generation P is a generation that engages themselves actively in communication events. They are not satisfied with just watching television broadcast or listening to the music played on the radio with songs selected by the DJ. Beyond that, they prefer being actively engaged in discussing a piece of writing or an issue, selecting the songs to be listened to, presenting a piece of writing or “bringing up” an issue to the public. The piece of writing or issue presented to the public is deliberately disseminated to be delivered, reported or discussed in a public area.

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One of the needs in the knowledge era is the need for scientific activities. It is arguable that in this era scientific activities constitute the basis of the life. Scientific activities are necessary for the knowledge era as in this era, knowledge is an instrumental commodity. Knowledge is only obtainable when a scientific activity is conducted.

One of the forms of scientific activities is writing scientific works. A scientific work is writing of knowledge presenting facts and is written consistently with the appropriate and correct writing methodology (Haryanto, 2000). Zaenal (1998) further defines scientific work as a paper or writing obtained in line with its scientific nature, based on the results of observation, review or research in a certain discipline, organized in accordance with a certain method with writing systematization in a polite language, and the truth and the nature of science of whose content are accountable. Therefore, it can be concluded that a scientific work is writing of science that presents data and facts obtained from the activities of thinking, observation, review or research in a certain discipline by employing a certain method and systematization. In other words, scientific writing is a work created by utilizing the activity of reading-writing-critical thinking sufficiently.

Regrettably, not all students are capable of writing scientific works properly (Alwasilah, 2012). This is evident from the experience of the researchers when teaching the Bahasa Indonesia course whose one of assignments is writing scientific works. This experience shows that in the scientific works written by the students, there are still multiple errors in the content, systematization and language aspects found. This experience of the researchers is in line with the findings of Muti’ah et al (2012), showing that in the students’ scientific works, many faults and errors were found, be it in the content, writing organization or language use. This condition was responsible for the failure to obtain maximum learning outcomes. Out of the 32 students of writing course in the even semester of academic year 2005/2006, 9.4% achieved the maximum grade A, 25% gained grade B, 59.4% gained grade C and 6.2% gained grade D.

According to the findings abovementioned, it is apparent that one of the weaknesses of the students in scientific work writing is a weakness in content. It is evident from (a) the students’ inability to develop ideas, (b) the students’ inability to relate facts/data to relevant theories, (c) the students’ inability to stay focused on the initial idea, and (d) the students’ inability to sort relevant and important information out from irrelevant and unimportant information.

It is possible to overcome the weakness in content through academic literacy development based on content area literacy (Eanes, 1997). Furthermore, Eanes states that content area literacy refers to a combination of reading, writing and critical thinking for the purpose of learning in a certain discipline. McKenna & Robinson (1990) define content area literacy as the ability to use reading and writing for the acquisition of content in a given discipline. According to this description, content area literacy can be used for promoting the students’ ability in writing scientific works in terms of content.

Based on the explanation above, it can be concluded that it is necessary to have innovations in language learning (Anburaj et al, 2014), including in the learning of scientific work writing. With regard to the ICT development in this knowledge era, the learning innovations should also be adjusted to the current ICT development. Therefore, the learning of scientific work writing may also be conducted along with time. One of the ways for improving the capability of writing scientific works while simultaneously keeping up with the ICT development is employing the blended learning strategies combined with content area literacy.

DISCUSSION
The Significance of Content Area Literacy in Scientific Work Writing

The National Literacy Act of the U.S. (1991) defines literacy as... an individual’s ability to read, write, and speak... In the wider context, Kern (2010) refers literacy to the use of the practices of social, historical, and cultural situations in creating and interpreting meaning through texts. Based on those definitions, it can be concluded that literacy is anything related to reading and writing.

Based on the definitions mentioned previously, literacy is an ability to read and write. However, in its development, the definition of literacy has broadened as literacy activities encompass not only reading and writing, but also critical thinking. Critical thinking is useful in the analysis of information gained, allowing the person to have an intense curiosity about his or her reading and to continuously seek the truth to be used as an idea for writing. Hence, literacy is always constructed by the synergy of reading, writing, and critical thinking. Reading, writing, and critical thinking themselves constitute a form of academic activity (Hambali, 2016).

Moreover, Hambali (2016) also explains that the various activities related to curiosity and critical attitude about information concerning academic purpose through reading, writing, and critical thinking can also be referred to literacy. In other words, literacy is also pertinent to a set of abilities necessary for finding, obtaining, analyzing and utilizing information concerning academic purpose followed by the consciousness to understand, retain and communicate information for an academic purpose. In this case, the academic purpose referred to is writing scientific works. Hence, to produce a good scientific work, it is necessary to have adequate literacy ability.

One of the forms of literacy in content area literacy. Eanes (1997) reveals that content area literacy refers to a combination of reading, writing, and critical thinking for the purpose of learning in a given discipline. McKenna & Robinson (1990) define content area literacy as the ability to use reading and writing for the acquisition of certain content in a given discipline. Based on this explanation, content area literacy can be used for promoting the students’ ability in writing scientific works in terms of content as a followup of reading (Arrastia, et al., 2013).

Content area literacy can be applied in any level: elementary school, middle school, or university. In such literacy levels, the ability to manipulate and play on various symbols, theories, information and so on as the work of
scientists is covered (Suyono, 2012). From the existing levels, Langshear (2001) as quoted by Suyono (2012) states that the orientation of the development of learners’ literacy behavior is directed toward an advanced literacy level.

The Utilization of Blended Learning Strategies to Improve the Students’ Capability of Writing Scientific Work

Sejadi (2014) and Johnson & Marsh (2014) convey that the learning in the knowledge era has an implication for the change in learning approach, which enables people to learn anywhere, anytime and with anyone, and through any learning source. One of the learning forms in the knowledge era is blended learning. The use of blended learning strategies may cut the limits or barriers found in the traditional learning.

There are plenty of definitions of blended learning (BL) – usually referred to as hybrid learning. Staker (2011) states that BL is when students learn in part in a brick-and-mortar location away from home and in part through online delivery and some element of students controls over time, place, path and/or pace. This definition covers two important clauses distinguishing BL from other variations of learning. Firstly, the students must learn in “a supervised brick-and-mortar location away from home” for some time.

Secondly, to be called as BL, students must attend online learning by taking control over time, place, path and/or pace of learning. This control element of students is essential in the definition of BL as it differentiates online learning from other forms of learning.

Stacey & Gerbic (2009) define BL as learning that combines physical and virtual environments. This means that BL refers to the integration of face-to-face learning and learning via the Internet. In agreement with Stacey & Gerbic, Seaman & Garrett (2007) define blended learning – also referred to as hybrid learning – as learning in which 30 percent to 79 percent of the learning content is delivered online. This numerical description, however, still requires some clarification.

The learning employing BL strategies will run well if the learning components are applied properly. The components of learning employing BL strategies are described as follows (adapted from Stacey & Gerbic, 2009; Eanes, 1997).

Flexible scheduling and varied discussion group members

Based on the definition of BL previously stated, one of BL characteristics is being not bound by space and time. This means that learning can be done anywhere and at any time. This is based on the fact that face-to-face meeting is not an absolute requirement in BL. Granted, lecturers and students may have a face-to-face meeting following the schedule set by the university, but they may also have nonface-to-face learning outside the official schedule issued by the institution. Moreover, in writing a scientific work, a student may need a longer period of time to complete their task. Thus, learning should not be restricted to classroom face-to-face meetings only.

As the learning activity is not always carried out face-to-face in a classroom, if it is necessary, a lecturer may organize online learning for all students from any class who are taking the same course. For instance, if the students of Biology Department and Physics Department are taking the Bahasa Indonesia course, and they are assigned to write scientific works, the lecturer may create a cross-discipline open discussion group, allowing the works they write to be looked from differing perspectives.

Forms of Learning Activities

There are numerous learning activities that can be carried out in BL, one of which is a discussion. The discussion is not a new character in the education setting and its ability to enhance intellectual skills such as analysis and synthesis, dealing with ambiguity and complexity, and other skills such as empathy, listening respectfully, communication and collaboration have been recognized (Brookskidiscipline & Preskill in Stacey & Gerbic, 2009). From the Vygotskian perspective (1978), a dialog with someone more knowledgeable is a mechanism continuously used wherever learning takes place.

At times, there are errors found in the scientific works produced by students. Feedback should not be given one way, but two ways. That is to say that the one providing feedback writes a note of the weaknesses and errors found in the student’s scientific work, and the student as the writer is given an opportunity to explain or even ask some questions about the feedback given (Homayounzadeh et al, 2016). Thus, there is a dynamic interaction between the one giving feedback and the writer, enabling the writer to know exactly his or her weaknesses and errors and to correct the errors more easily.

The results of the research by Ahmad & Besharati (2017) show that two-way feedback yields better learning outcomes in comparison to one-way feedback. In addition, the findings of Ahmad & Besharati also demonstrate that online feedback is effective for improving learning outcomes as the students are free to ask, explain, and correct their writing at any time, not bound by space and time. The results of the research by Mut’ah et al (2012) also show that consultation the writing scientific works using e-mail has been proven to improve the quality of students’ scientific works as the students are able to discuss with the lecturer more freely. The use of e-mail is based on the consideration that e-mail can bridge the academic communication between students and lecturer, and vice versa (Haryono, 1995). Using e-mail, the result of the writing exercise can be monitored anytime and anywhere, making the learning process run more effectively and efficiently.

Authentic, thorough assessment

One of the bad possibilities that may happen in BL is that the students are not actively engaged in the online learning. For instance, the students are physically present in the face-to-face meeting in a classroom, but they are not actively engaged in online discussion or lecture. Students have never involved actively in commenting on the works of their classmates online. Hence, it is necessary that the lecturer takes a firm measure in the form of thorough
assessment of every student’s activity. In other words, the assessment is done based on the students’ portfolio. This assessment model is considered as fairly effective, especially for the learning of writing (Litz, 2013).

To enable thorough assessment, it is important that the lecturer explains to the students that assessment of every learning activity students does, be it a face-to-face activity or virtual activity, is carried out authentically. The students’ grades are not only determined based on scientific work produced and the learning activity in the classroom, but also the virtual discussion activity. If necessary, the lecturer should record or document students’ virtual activity. Thus, it is expected that students are active in the learning, either face-to-face or virtual. Otherwise, they will think of virtual learning as frivolous.

**The role of the lecturer as a facilitator/mediator**

Learning using BL model is carried out by combining face-to-face meeting and nonface-to-face meeting. In spite of nonface-to-face meeting, the role of a lecturer remains important. A lecturer in not face-to-face learning plays a role as a facilitator and/or mediator. The lecturer’s role, especially in nonface-to-face learning, can be performed both actively and passively (Stacey & Gerbic, 2009). A lecturer having an active role means that he or she takes part in guiding, facilitating or moderating the course of the discussion. With regard to this matter, the lecturer’s presence is necessary for ensuring that the online discussion runs well in the construction of new understanding and knowledge. A lecturer having an active role means that he or she does not participate in the discussion. From time to time, the lecturer’s presence is not needed for the sake of creating a symmetrical discussion, in which all participants have equal status and control. This will contribute to the balanced authority of each student (Holder, 2015). Then, the students must develop their own ideas and be responsible for the discussion.

**Virtual learning environment/context**

Laurillard (in Stacey & Gerbic, 2009) describes virtual learning environment as a system of meeting that “supports an online learning environment where users send and receive text messages, usually read and write messages offline and then connect themselves to the system to upload their messages and download new messages.” Such a learning environment is a new learning domain with distinguishing characteristics of being not bound by time and place, many communication skills, interaction with computer media and other text-based characteristics.

**Text-Based Properties**

Reading and writing in this text-based media creates discussion different from oral, face-to-face discussion. This discussion gives an opportunity for students to get used to reading. This opportunity allows the students to compare their posts to the posts of others. This comparison enables students to compare their knowledge and to observe successful learning strategies. For example, they observe other students who implement theories and provides rationales as well as evidence.

The Implementation of Blended Learning Strategies Combined with Content Area Literacy in the Learning of Scientific Work Writing

The development of academic literacy in the learning of scientific work writing employing BL strategies is conducted following these steps. First, the lecturer uploads the lesson plan in the learning menu on the university’s website (if the menu is available on the university’s website). If the learning menu is not available, the lecturer may upload the lesson plan on the blog or class’ social media group. The uploaded lesson plan can be downloaded by the students attending the course. Second, during the face-to-face meeting, the lecturer and the students identify themes fitting the subject matter that can be developed into scientific works in a brainstorming session. Third, the lecturer and the students keep the theme within the topic of the scientific work agreeing to the discipline. Fifth, the lecturer presents an outline example. Sixth, the students write outlines. Seventh, the students publish their outlines on the class’ social media group. Eighth, the students and the lecturer comment on the outlines made by the students. Ninth, the lecturer presents the material for the development of scientific works in the form of a video via the class’ social media group. Tenth, the students develop scientific works based on the lecturer’s explanation. Eleventh, during the face-to-face meeting, the lecturer monitors the students’ scientific work development. The students may ask to, or consult, the lecturer regarding the development of their scientific work. Twelfth, the students post their half-finished scientific works on the class’ social media group to discuss with other students. In this discussion, the lecturer does not take part in order to allow for free discussion. Nevertheless, the lecturer still monitors the ongoing discussion. Thirteenth in the classroom, the students deliver the result of their discussion via social media to the lecturer. The lecturer then provides reinforcement. Fourteenth, the students revise their scientific work. Fifteenth, the students submit their scientific works to the lecturer for feedback (the students consult the lecturer online). Sixteenth, the students revise their scientific works, print them, and present them in the classroom. Seventeenth, the students do peer-assessment of the scientific works they have developed. The lecturer provides assessment rubric. Eighteenth, the students revise the scientific works they have developed based on the notes and feedback from other students and the lecturer. Nineteenth, the students recorded videos for their scientific work presentation and publish them on the class’ social media group. The students and the lecturer comment on the presentation. Twentieth, the students submit the scientific works via e-mail to the lecturer.

**Evaluation and Follow-Up**

**Obstacles Faced in the Utilization of Blended Learning Strategies Combined with Content Area Literacy to Improve the Capability of Writing Scientific Works**

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The explanation above shows that the students’ capability of writing scientific works should be improved in all courses, even if it is done without employing blended learning strategies or content area literacy. However, with regard to this discussion, writing scientific works can be improved by utilizing blended learning strategies combined with content area literacy. In implementing these learning strategies, some obstacles may occur. The obstacles are outlined as follows:

_Firstly_, not all students have a high awareness of reading, writing and critical thinking. This leads to the low motivation of scientific work writing.

_Secodnly_, there is a lack of good coordination of the leaders of the university, lecturers, students and educational personnel in the writing of scientific works using blended learning strategies combined with content area literacy. This may inhibit optimum learning. For example, the students may have high motivation to write scientific works, but they do not master the content area, and the lecturer does not provide any support and assistance for the students to gain adequate understanding. This may lead to the decreased motivation of the students in writing scientific works.

_Thirdly_, there is a lack of facilities and infrastructures. The limited variety of the available works of literature, lack of adequate ICT devices, low internet bandwidth for accessing resources online, small number of hours of service of the library, and poor service of librarians will be a huge setback in the scientific writing, especially when the students seek better understanding on the content area of the scientific works written, and when they need the materials in the library. This setback even can hinder the success of not only scientific work writing but also the general literacy culture.

_Fourthly_, there is no good model of the lecturers or the leaders of the university in writing scientific works. The results of the research by Setiadi (2010) show that modeling in reading and writing is not common among teachers although teachers/lecturers serve as the spearhead of literacy education (Alwasilah, 2012:172). In other words, building the nation’s literacy (including writing scientific works) must be started by building teachers’ professionalism and ability to provide literacy education.

_Fifthly_, there is an absence of integrated curriculum in the university. For example, all this time, the discourse of environment is only discussed among the students taking natural sciences. This is even not the case in every course. Thus, it is as though environmental issues are the responsibility of only the students taking natural sciences and courses related to the environment. On the other hand, the other courses, especially the general courses, have no portion to talk about environmental issues although they have a strategic position to become core courses that also discuss the environment. This is based on the consideration that general courses are taken by all students, allowing them to serve as media for discussing environmental issues. Thus, students will automatically discuss environmental issues as well. The lack of integrated curriculum makes it difficult for the students to understand the content area of the scientific works they write.

_Sixthly_, not all teachers and students are able to operate computer, tools or other electronic devices well. This will prevent the learning from running smoothly as the learning employing blended learning strategies highly require the ability of both the lecturer and the students to operate electronic devices well.

**Alternative Solutions for Overcoming Obstacles Faced in the Utilization of Blended Learning Strategies Combined with Content Area Literacy to Improve the Capability of Writing Scientific Works**

The solutions offered for overcoming the obstacles faced in the development of academic literacy to improve the students’ ability to write scientific works are presented as follows (adapted from Alwasilah, 2012; Setiadi, 2010).

_Firstly_, organizing activities that can raise students’ awareness to write scientific works, for example, _gerakan wajib membaca_ (reading movement), book review competition, scientific work writing competition, essay writing competition and so forth. These activities are expected to be able to increase students’ motivation to read and write.

_Secodnly_, including literacy movement at university into the regular agenda of the university. The literacy movement at university can be in the form of reading week, book affair, public discussion and book review.

_Thirdly_, providing books, journals or other reading sources, printed or in softcopy. The sufficient availability of reading materials will indirectly increase reading motivation. There will be many options for reading sources for students to read, so their reading motivation will be improved.

_Fourthly_, providing adequate opportunity to access literature. This can be in the form of the improvement of library facilities, for example, comfortable reading room, adequate reading materials, long library operating hours, and friendly and comfortable service by librarians. This adequate opportunity is expected to provide convenience for the student to access literature; which eventually will increase their literacy interest as well.

_Fifthly_, giving a good model for the students in terms of literacy, for example improving lecturers’ publications and demonstrating them to the students. An adage says that _one example is better than a thousand words_. This means that teachers’ modeling will improve the students’ motivation to build sufficient literacy culture. The students become motivated to at least equalize, try to equalize, or even surpass the lecturers’ achievements.

_Sixthly_, cooperating with the lecturers teaching the courses related to the scientific works developed by the students. As stated in the introduction, one of the weaknesses found in the students’ scientific works is the weakness in content. This weakness can be overcome by improving the students’ knowledge and understanding regarding the topics of the scientific works developed. The improvement of knowledge and understanding is only possible if the lecturers teaching the courses related to the work are active in improving the students’ knowledge and understanding. The involvement of the lecturers in improving the students’ knowledge and understanding also serves as a responsibility of the lecturer in developing students’ literacy.
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