Blended Formula Four Di (4D) with Actor-Network Theory to Increases the Outcome of Literacy Culture

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Article Info	ABSTRACT
	By involving various components that exist, schools try to improve the literacy culture of the school residents. The effort was made through the application of Formula Four Di with the actor-network theory. The purpose of this research is to evaluate the effectiveness of the Blended Formula Four Di (4D) with Actor-Network Theory in increasing the outcome of literacy culture is a case study that involves all school members. The obtained data were analyzed by using qualitative descriptive methods. The analysis results inform that the Blended Formula Four Di (4D) with Actor-Network Theory has proven to be effective in improving the outcome of literacy culture in schools. The application of "Blended Formula Four Di (4D) with Actor-Network Theory to Increases The Outcome of Literacy Culture" is also able to improve literacy culture in SMAN 1 Ngimbang (Senior High School in Indonesia) with indicators (1) increasing the number of visitors and borrowers in the library, (2) increasing the writing of the school residents, and (3) becoming the winner of the library competition.

INTRODUCTION

The indicated literacy culture of Indonesian people's reading and writing culture is relatively low. UNESCO's findings in 2012 related to the reading habits of Indonesian people stated that only one of 1,000 Indonesian people read. Besides, the 2016 PIAAC or Program for the International Assessment of Adult Competencies test for adult skill level also showed alarming results. Indonesia is ranked lowest in almost all types of competencies needed by adults to work as members of the community. Literacy is very necessary for students (Baleiro, 2011; Gaske & Ozola, 2008; Jane, 2012; Mills, 2010; Musfiroh & Beniati, 2016; Nurdiyanti & Suryanto, 2010; Odegaard et al., 2014; Shofa & Setyawan, 2018; Stephen, 2015; Suryaman, 2015; Wandasari, 2017; Yuliyati, 2014). Literacy activities have been synonymous with reading and writing activities (Muslimin, 2018). Gong & Irkham (2012) mention the cause of the low culture of literacy in Indonesia is the lack of available reading books at affordable prices. Improving literacy culture among the younger generation requires the full attention of all parties to prepare various matters related to culture or habits as stated by Nurgiantoro (2005) that the culture that surrounds children is a variety of customs, verbal and nonverbal behaviors, and others as demonstrated concretely by and in the family environment.

Literacy in the era of the industrial revolution 4.0 became the center of attention of academics because the development of science and technology is an attempt to understand the conditions of the times. Students' language literacy skills are tested by measuring aspects of understanding, using, and reflecting reading results in written form. Indriyani (2019) revealed that student literacy needs to be improved, especially literacy. In addition to knowing through the literacy test that has been carried out by several institutions, it is necessary to know how the literacy implementation has been

implemented by schools. Besides, it is also necessary to know the results of the literacy implementation on the fundamental aspects through student responses.

To face the era of the industrial revolution 4.0, literacy skills are needed, namely education that can form creative, innovative, and competitive generations. One of these things can be achieved by optimizing the use of technology as an educational aid. Indonesia also needs to improve the quality of graduates according to the world of work and the demands of digital technology. The era of the industrial revolution 4.0 came together with the era of disruption. To face the industrial revolution 4.0 or the era of disruption needed "new literacy" in addition to old literacy. The existing literacy is currently used as capital to take part in community life. The intended new literacy is focused on three things: 1) digital literacy, 2) technological literacy, and 3) human literacy (Ibda, 2018; 2019). Literacy is the ability to read and write. The development of literacy becomes very important to note because literacy is an initial ability that must be possessed by every individual to live life in the future. Old literature includes the competence of listing. Whereas new literacy includes data literacy, technological literacy and human literacy.

The low literacy culture also occurs in SMAN 1 Ngimbang (Senior High School in Indonesia). Reading or writing is not a habit for the citizens of SMAN 1 Ngimbang. In various moments, for example when students are waiting for pickup, what they do is not reading, but chatting with friends or playing cell phones. This condition also occurs in other school residents. Even if someone reads, the amount is very small. It seems that this condition also occurs in Indonesian society in general. This condition clearly causes for concern because the ability and reading skills are the basis for the acquisition of knowledge, skills, and the formation of someone's attitude. The efforts are being made to overcome these problems through a massive and structured movement, the school literacy movement. The government through Permendikbud No. 21 of 2015 concerning the Character Development has launched a school literacy movement (Depdikbud, 2015). The movement was immediately addressed by all schools in Indonesia by taking various actions according to the school's ability and readiness. The readiness in this case includes the readiness of the school library.

The school library is the most important part of the education unit and is an effort to succeed in the school literacy movement. The success of the school literacy movement and the quality of the school is greatly influenced by the quality of the library. This shows how important the existence of school libraries in the education unit and the success of the school literacy movement. However, the empirical facts show that the existence of school libraries in the school environment is still very alarming and needs attention. This condition implies that the attention of policymakers in the school environment has not prioritized the school library as a school program that needs attention to support the school literacy movement and support teaching and learning activities.

Nowadays, the activities in schools are suspected to have not been optimal in developing the literacy abilities of the school residents, especially teachers and students. This is partly caused by the limited facilities and infrastructure of the library, in addition to the understanding of the school community about the importance of literacy in their lives. SMAN 1 Ngimbang is also not free from these limitations, especially the limitations of library reading rooms, the number of collections, and the form of library services. The data taken in 2018 shows that the total number of library collections in SMAN 1 Ngimbang is only 2,326 titles with an overall collection of 3,803 copies. With

the number of students as many as 29 classes, those book collections are lacking. Likewise, with the availability of a very narrow reading room and an ineffective service system. To improve these conditions, by involving various components that exist, schools try to improve the literacy culture of the school residents. The effort was made through the application of Formula Four Di with the actor-network theory.

Research Problems

The purpose of this research is to evaluate the effectiveness of the Blended Formula Four Di (4D) with Actor-Network Theory in increasing the outcome of literacy culture is a case study that involves all school members. Research problems of this research as follow: (1) How are the efforts to fulfill the representative infrastructure of literacy movement in SMAN 1 Ngimbang? (2) How to improve literacy culture in SMAN 1 Ngimbang?

METHOD OF RESEARCH

In the school environment, the library has a strategic role in terms of providing facilities to increase students' interest in reading. Interest and fondness for reading does not automatically belong to anyone, including children of school age. Interest in reading can grow and develop by being shaped. In this effort, several theories can be used, theories that underlie all activities as an effort to solve the problem, like stimulation theory, Actor-Network Theory, Formula Four Di, and literacy.

Theory of Stimulation and Encouragement

Encouragement is a motivational force that encourages the birth of behavior that leads to goal achievement. The encouragement, in this case, is the motivation that is not only for certain behaviors, but any behaviors related to basic needs desired by someone. These encouragements can arise from within the person or can be stimulated from the outside. Noting the origin of the urge to behave, it can be predicted that reading interests and hobbies can arise in themselves or from people or the environment. Outside encouragement must be prepared or conditioned by the school in the form of creating a literal and conducive school environment. Among them are creating a reading room, expanding library collections, simplifying services, building networks.

Actor-Network Theory

The essence of Actor-Network Theory is that a reality stands not in a vacuum. That is, reality is formed due to various factors that are around it, both human and non-human factors. Generally, Actor-Network Theory develops concepts about actors, networks, translation and intermediaries. However, only actors and networks are explained in this paper because these two concepts play a major role in this paper.

Actors are all elements that are connected in the system that will form a network naturally. In this case, the actor is defined as something that comes into action, which is not only human, but also non-human, such as technical objects, institutions, associations, institutions, and so on. The number of actors or actors in acting is unlimited. For example, the head of the library as one of the actors does not act alone in developing the library because he needs other actors, such as publishers, school principals, teachers, library ambassadors, IT experts, and so on.

Network is a symptom, or one that is connected. As an illustration, when a reader will read a book, many things influence it. For example, the reader is influenced by his

friends, environmental conditions, his teacher, books, and various other factors. All of these factors are connected (in a network) that causes how readers to act. The reader will not read in empty condition (without influence), but under the influence of various factors. All influencing factors must be considered together, called "actor-networks".

The actor-network consists of a together network, both technical and non-technical elements. Following the example above, it is not only the capacity of the reader, but also the influence of the surrounding elements. This means that the concept of networks does not only focus on the social relations of human actors, but includes non-human actors.

Formula Four Di

Formula Four Di is the used strategy in efforts to improve literacy culture. The term Four Di is an abbreviation of the close, distributed, interpreted, applied. Formula Four Di contains four phases: (1) enclosed phase, (2) distributed phase, (3) interpreted phase, and (4) applied phase. In the enclosed phase, the library management made an effort to bring the literacy material closer to the reader and make a promo. In the distributed phase, the readers are obliged to tell or inform what has been read to others. In the interpreted phase, the readers must explain what the benefits of the read books or other literacy materials. The applied phase is the production phase. The reader applies the benefits of the previous three-phase process by creating, following up, producing, or practicing in the form of work, attitude, or behavior.

Good practice in the effort to improve the literacy culture of school residents in SMAN 1 Ngimbang began in the 2018/2019 school year by carrying out an inventory of problems, making plans, implementing programs, and even conducting evaluations. The targets and subjects of improving the culture of school literacy are all school residents. In the context of schools, the subjects in literacy activities are all school members, namely students, educators, education personnel, and school principals (Wiedarti & Kisyani, 2016).

The strategic program that has been carried out is to improve the literacy culture of school residents in SMAN 1 Ngimbang with Formula Four Di that utilizes a network of actors. The application of Formula Four Di to improve the literacy culture of school residents at SMAN 1 Ngimbang is explained as follows.

Enclosed Phase

Bringing literacy materials closer to the reader through various efforts. One of the ways is by making every corner of the school area as a reading room. The effort was followed by efforts to change the mindset of school residents that the reading room does not have to be a room inside a library building, but all corners, all places in the school area can be considered as reading rooms. Every class has a reading corner, every support room (teacher's room, administration's room, School Health Unit room, scout room, laboratory room) has a reading corner, and every corner in the school area is made into a reading room

There should be sufficient literacy material in every corner of the reading room,. This has implications for increasing the number of collections and titles of books or other literacy materials. What schools do is allocate the School Operational Costs budget for the procurement of books by 20%. The book procurement team is formed by the school then the team determines the books to be purchased by paying attention to the

aspirations of all school residents, especially students and teachers. In conveying aspirations, students convey it through the aspiration tree.

In addition to utilize 20% of the school budget for library development, library management also collaborates with other parties to obtain assistance or book grants, for example in cooperation with the Public Library and National Narcotics Agency. Another breakthrough is the book alms action. Library management prepares alms boxes made of unused cardboard boxes and place them in various reading corners. Students, teachers, parents, and anyone who has books or other unused literacy materials can give it to the school library by putting it into the book alms box.

In the enclosed phase, library management does not merely bring the text material physically closer to the reader. Library management also makes brochures or promos of new books or interesting books in addition to provide excellent service. One of them is service in borrowing and returning books or literacy materials. Book loans are carried out by self-service. After finding the book members are looking for, they direct the barcode label on the book to the barcode sensor. After that, members point the barcode on the member card to the barcode sensor. If they hear the sound of "tit", it means that they have successfully borrowed the book.

Returning books is also done by self-service such as borrowing books. Therefore, the members-only need to direct the barcode label on the book to the barcode sensor and direct the barcode on the member card to the barcode sensor until the "tit" sound is heard. Another undertaken activity is the creation of a text-rich environment. This activity is carried out by displaying the students' work, interesting banners/slogans, inspiring and motivating school residents in all areas of the school. Besides, the provision of literacy parks and reading corners (outdoor libraries) is also expanded.

Distributed Phase

To attract or influence other readers, the readers must share the literacy material that they have already read with others: friends, parents, brothers, sisters, or other close people. The time to tell can be done inside or outside the learning process. If it is done outside the learning process, students can show evidence that they have told others through recorded evidence, writing or pictures/photographs. To be effective, the implementation of this distributed phase, schools could involve teachers, especially language teachers.

Interpreted Phase

The readers must know and explain the benefits of the book or literacy material that has been read. Readers, especially students, should be able to take benefit from the books or literacy materials they have read. This must be shared by the concerned person toward the audience in learning languages, both *Bahasa Indonesia, Bahasa Jawa,* and English.

Applied Phase

The estuary of all phases is the applied phase. In this applied phase, the reader applies knowledge or skills as a result of receptive activities by creating, following up, producing, or practicing in the form of works, attitudes, or behaviors. The form of activity from the applied phase includes taking part in various competitions, writing and publishing work in the school wall magazine, publishing a collection of poems and a collection of short stories, or other good attitudes and behaviors. This is not only done by students, but also by teachers and principals.

RESULTS AND DISCUSSION
Facilities of Literacy Action Infrastructure in the SMAN 1 Ngimbang Environment
The availability of a Representative Reading Room in SMAN 1 Ngimbang

Before this The Formula Four Di was implemented, school residents only assumed that the library reading room only existed in the library building, which was only 3 m² in length. After the implementation of Formula Four Di, school residents can read in the reading rooms that are spread in all areas of the school.

The increase in the number of Title and Collection of the Library Books

With the implementation of Formula Four Di in the enclosed phase, the addition of the number of book titles and the collection of books has increased significantly. In addition to maximizing the 20% budget allocation from School Operational Costs funding for library development, collaboration with other agencies and the opening of a book alms box has a major impact on increasing the number of titles and collections of books or literacy materials. An increase in the number of titles and book collections can be seen in the following comparison Table 1.

Table 1. Comparison of Number of Book Collection and Titles Before and After The Application of Formula Four Di.

	Before the Application of *Formula Four Di*			After the Application of *Formula Four Di*		
	Fiction	Knowledge	Amount	Fiction	Knowledge	Amount
Book Tittle	860	1.279	2.139	1.282	1.817	3.099
Book Collection	1.099	2.429	3.528	1.721	5.205	6.927

Literacy Culture in SMAN 1 Ngimbang
The Increase in The Number of Visitors and Borrowers in the Library

The made efforts by the school to improve the literacy culture of school residents by applying the Formula Four Di with Actor-Network Theory have reaped very good results. This can be seen from the increase in the number of library visitors and the number of borrowers. The increase was seen from the difference in the number of visitors and borrowers before making strategic efforts and after making the strategic efforts. Based on reports in March, April, and May 2019 or before the undertaking strategic efforts, the total number of visitors in March 2019 was only 225 people and the number of borrowers was only 41 people. More data can be seen in the following Table 2.

Table 2. Number of visitors and book borrowers in 2018.

No.	Month	Visitor	Borrower
1.	March	225	41
2.	April	647	120
3.	May	1.047	213

Meanwhile, based on reports in March, April, May 2019 or after strategic efforts, the total number of visitors in March 2019 has increased to 1,160 people and the number of borrowers has reached 454 people. More data can be seen in the following Table 3.

Table 3. Number of visitors and book borrowers in 2019.

No.	Month	Visitor	Borrower
1.	March	1.160	454
2.	April	1.204	416
3.	May	1.002	473

In comparison, the number of library book visitors and borrowers in the period before the strategic efforts and after the strategic efforts were made, there was a significant increase. This can be seen in Table 4 below.

Table 4. Number of visitors and book borrowers in 2018 and 2019.

No.	Month	2018		2019	
		Visitor	Borrower	Visitor	Borrower
1.	March	225	41	1.160	454
2.	April	647	120	1.204	416
3.	May	1.047	213	1.056	473

The data in Table 4 shows that the undertaken strategic efforts in the form of making reading corners in the school areas as reading rooms outside the library room accompanied by the addition of collections and book titles have brought results with increased the reading interest of the school residents.

The Increase of School Residents' Writing Activities
The estuary of the application of Formula Four Di is the creativity and productivity of school residents in literacy activities. The activity is illustrated in the following literacy products: (1) the publication of two books of poetry collection and a collection of short stories written by students, (2) the involvement of three teachers in the publication of the anthology book "Inspirational Stories", (3) the principal produces several writings that are published in the local mass media "*Radar Bojonegoro*", (4) The active Facebook, Instagram, and web page of SMAN 1 Ngimbang that contains various news and information about SMAN 1 Ngimbang, (5) The active online and offline school wall magazines.

CONCLUSIONS
The application of "Blended Formula Four Di (4D) with Actor-Network Theory to Increases The Outcome of Literacy Culture" can solve problems related to literary culture in SMAN 1 Ngimbang. This success can be seen in the fulfillment of infrastructure facilities that support the school literacy action in the SMAN 1 Ngimbang environment with indicators (1) availability of a representative reading room and (2) meeting the need for the number of the book titles and collections or literacy materials. Besides, the application of "Blended Formula Four Di (4D) with Actor-Network Theory to increases the outcome of literacy culture" is also able to improve literacy culture in SMAN 1 Ngimbang with indicators (1) increasing the number of visitors and borrowers in the library, (2) increasing the writing of the school residents, and (3) becoming the winner of the library competition.

ACKNOWLEDGMENTS

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