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To cite this article: K N S Effendi et al 2019 J. Phys.: Conf. Ser. 1166 012021

View the article online for updates and enhancements.
Practicality: Mathematics student worksheet for school literacy movement development stage

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Abstract. This research is a development study that will produce reading texts for the school literacy movement at development stage in practical mathematical learning. The method in this research was design research with development study which consist of preliminary, prototyping, and assessment. The evaluation used in prototyping stage was formative study, including self-evaluation stage, expert review and one-to-one, small group, and field test. In this article, the result discussion is on small group phase. The subject of this research was the students of grade VII SMP Karawang. Data collection was done by documentation and interview. Based on the results of data analysis, it can be concluded that this research has produced text reading for the school literacy movement at development stage in practical mathematics learning.

1. Introduction

The achievements of Indonesian students' literacy seen as a result of Indonesia's participation in several international comparative studies have not yet shown satisfactory achievements in both the Trends in International Mathematics and Science Study (TIMMS) and the Program for International Student Assessment (PISA). These results indicate that the interest in reading and literacy of students in Indonesia is still low so it can be said that it is a serious problem. The school literacy movement is one of the spheres of the National Literacy Movement which is an effort to synergize all potentials and expand public involvement in growing, developing and cultivating literacy in Indonesia [1]. Understanding of literacy is not just the ability to read and write, but also the ability to use the reading for the readers' life skills. Therefore, literacy in the reading and writing context becomes one of the needs that must be fulfilled and can’t be separated from daily life. Context plays an important role in learning and assessment, because students are prepared to welcome future challenges, so it needs to be introduced to a variety of contexts covering various aspects of life [2].

The school literacy movement is a literacy movement that the majority of its activities carried out in schools by involving school residents such as students, teachers and education personnel. The school literacy movement is a movement to cultivate the character of students through the culture of school literacy ecosystem so that they become lifelong learners [3]. The activities involve school residents, academics, publishers, mass media, communities, and stakeholders under the coordination of “Direktorat General Pendidikan Dasar dan Menengah Kementerian Pendidikan dan Kebudayaan” as an effort to realize the reading habit for students. This habit is done with 15 minutes activity and after the reading habit is formed, then it is directed to development stage and learning (with charges based on
Curriculum 2013). The school literacy movement is implemented as a habit and culture in the school environment so it can be integrated in teaching and learning activities in school and it becomes an integral part of all series of students and teachers’ activities in learning activities including mathematics learning. The implementation of school literacy movement at this time is still at the stage of habituation while the development stage and learning stage have not been implemented because of the difficulty of teachers to obtain non-lesson books in accordance with mathematical material to be studied.

The objectives of the school development literacy movement at junior high school include sharpening students' abilities in response to the oral and written enrichment books; building interaction between students and between students and teachers about reading books; sharpening the ability of students to think critically, analytically, creatively, and innovatively; and encouraging students to always look for links between books [4]. Furthermore, the objectives of the school literacy movement of the learning stages at junior high school include developing the ability to understand the text and relating it to personal experience so it will form the lifelong learners; developing critical thinking skills; cultivating and managing communication skills creatively through activities to respond to text books and lesson books [4]. Based on the objectives, the reading activity is done on all subjects including in the mathematics lesson and after reading the students are directed to know the relation of the book that has been read with the mathematics material that will be studied in the development stage. Furthermore, the context of the book can be used as a starting point in the learning of mathematics, especially at the learning stage. The context or experience of students is used as the starting point of the learning process of mathematics [5][6]. One of the enjoyable students’ experiences is the activity of students in sport.

Sport is a physical activity that has been done with the intention to maintain health and strengthen the muscles of the body and in its development can be done as an entertaining and fun activity, or also done with the aim to improve achievement [7]. Sport is an activity of human motion where in the implementation there are elements of play, a sense of fun, done at leisure, and the satisfaction. Sport activities are outlined: fun/joy, expressivity, to keep fit, mental recreation, body and appearance, competition and achievements and social integration [8]. Thus, sport can be a context in mathematics learning. Sprint as one of sport activities has become a context in the mathematics learning. The sprint context in Asian Games can help students understand the fractional material [9]. In addition, the interplay of sports games shown by the shooting theory in futsal games says that shooting must pay attention to strength, accuracy, and speed [10]. One of the mathematical concepts in the theory is the speed that shows the relationship between mathematics and futsal game. At this time futsal became one of the popular sports in our community, especially for students. Futsal is a high-intensity indoor sport where short sprints and alternating direction changes with short rest periods of 5 vs 5 including goalkeeper [11]. The set is a group of objects that have certain and clear conditions [12].

Based on the description above, it shows the relationship between futsal game and mathematics material, so it can be a context in learning mathematics. The relationship between futsal game and mathematics and the interest of students especially on the sport and the difficulty of teachers obtaining text related to the mathematical material makes the researcher wanted to design a reading text for the school literary movement activity at developmental stages in the junior high school mathematics learning.

2. Method

This research is design research with development studies [13][14]. This study was conducted in three stages, namely preliminary or preparatory stage, prototyping stage, and assessment [15]. Meanwhile, to analyze the two previous stages, this study used the assessment stage [15][16]. Prototyping stage used formative evaluation path which includes self-evaluation, expert reviews, one-to-one and small group and field test. In this article, discussion of research is on small group phase. The small group phase is the phase at the prototyping stage.

The revision of the one-to-one expert reviews results in the first prototype will be use as the basis for revising the first prototype design, which is then referred as the second prototype. A second prototype
test was conducted on a small group consisting of 12 students. The small group stage involved 12 students [17]. The results from small groups became the basis for revising the second prototype design which was then referred to as the third prototype.

3. Results and Discussion
The small group phase is part of the development research to see the practical aspects of a product developed in a study. Practicality seen from observations on small group trials [18]. The reading text is valid based on the results of one to one phase and expert review [19]. The text for the development literacy movement at the development stage consists of five texts with the context of futsal game, the field and the futsal game ball, the basic futsal game techniques, the futsal game strategy, the sanctions in the futsal game, and the futsal game system. In small group phase, the second prototype which is the result of revision from expert reviews and one to one, has been validly tested on 12 senior high school students in Karawang.

The initials of the students are FCP, NP, SA, GM, ARF, BVR, SP, EAG, MNR, KBC, DF, DRS. Students read the text and after that they answer the question on the text that is prepared based on the goal of the development stage of school literacy movement that is students are able to find the connection between books that read by themselves and the surrounding environment [4]. The text is given gradually to simulate the execution time. School literacy movement strengthens the movement of moral character as stipulated in “Peraturan Menteri Pendidikan dan Kebudayaan Nomor 23 Tahun 2015”, that is the activity of 15 minutes of reading non-learning books before the learning began as an effort to grow reading interest [4].

During the reading activity, the researcher observed to see the difficulties that occurred during reading activities using the second prototype. Based on the observation, students like the text that read by themselves and they can answer the question in the text though there is a little need for direction to answer it. In the text entitled “the basic technique of futsal game”, it is presented definition and patterns that can be done to train basic techniques of shooting, passing, controlling and dribbling. In the explanation of the basic technique, there is passing exercise, a pattern that can be done on the practice of passing with several players at once. Passing and controlling are inseparable because after a team passing on another colleague then he will do the controlling at first before deciding to shooting, dribbling or passing again to other colleagues.

Figure 1. Passing and controlling exercises

![Figure 1](image)

Description:

- : player
- : Substitution Direction
- : Directions Passing Ball

Figure 1 is a practice pattern of Passing and Controlling with five players who take the form of lines that will be made if someone makes a pass on his partner, so it can help students to see the futsal connection with mathematical material, especially in the basic techniques of passing and controlling. From the text, students suggest their opinion about the benefits and the difficult word that are found in the text and the related material that is different from the text. If the text has appeal, benefits and ease of understanding the reading text and answers to the question then shows that the text has practicality. This is the result of students’ work after read the text about the basic technique of futsal game.
Figure 2 shows the answers of students that the text is easy for them to understand and there are benefits obtained by students after reading the presented text. This is indicated by the opinions of students that the presented text is beneficial to them, there are not many words that are difficult for them to understand, and for their opinions on mathematical material related to the basic techniques of futsal, they know that the basic techniques of futsal are related to lines, angles, and plane shapes materials. Students’ answers, that are able to mention mathematical material related to reading texts, can be used as a starting point for developing students’ mathematical literacy. Mathematical literacy helps someone to understand the role or usefulness of mathematics in everyday life [20].

Figure 3. Students’ comments

Figure 3 shows the students’ comments that the text they have read has benefits because they become more aware of futsal and know the relationship between futsal and mathematics. The researcher conducted interviews with several students and the results showed that the presented text and questions were clear and understandable to students, there was a lot of information they received, there were questions that were difficult to answer so they needed direction at first and the text section to be corrected was writing text at the end where the letter is not attached.

Based on the answers of the students, written comments and interviews indicate that the text is easy to understand and has benefits for students, and questions on the development stage can be answered so the students know mathematical material that can be learned from the text they read so the presented
text is said to be practical. According to Indonesian Dictionary, practicality is a matter of a practical nature, while practically shows an easy and agreeable subject based on practice. "Practically refers to the extent that users (or other experts) consider the intervention as appealing and usable in normal conditions" [21]. Practicality is seen as the main quality because an impractical assessment will almost certainly not last long, no matter how valid, and reliable [22].

4. Conclusion
This study produced a third prototype of reading text for school literacy movement at development stages in junior high school mathematics learning. The second prototype of the developed text is said to be practical based on small group results. The prototype was revised into a third prototype based on small group results to see the practicality of the usability, easiness and interest in the text that the students were reading. The text produced in the development stage consists of five texts consisting of field and futsal game ball, futsal game and futsal technique, futsal game strategy, sanction in futsal game, and futsal game system.

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