N-Gain Algorithm for Analysis of Basic Reading

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Abstract. The background of this research is to observe the effectivenes of the Basic Reading textbook as one of learning materials for reading subject. It is intended to discover the implementation of the Basic Reading textbook in one of the private universities in West Sumatera. The method of this research is descriptive research which quantitatively approaches. The second-year students of English Department at one of the private universities in West Sumatera were taken as the sample for this research. Data collection techniques were used tests; reading tests and observation; to identify students' soft skills. The researchers used one group pretest-posttest design which is calculated by using N-Gain Normalization. The data showed that there is significantly different between the result of the test before and after using the Basic Reading textbook. The result of N-Gain calculation shows 0.43 which is categorized as moderate which means the book improves students' cognitive learning outcomes in the reading subject. Thus, students also instill core ethical values in daily living. It can be concluded that the textbook used increased students' hard and soft skills.

Keywords: Basic Reading textbook, N-Gain, Character Values.

1. Introduction

Reading is an acitivity that used by the students in getting new information and improving their knowlegde. Reading is an activity to comprehend the material that will be learned by the students in school. By reading, students can get and catch the ideas from the lesson which they have study, especially in reading. Reading is one of the important activities that can help students to understand information from the texts. Reading can make students involved in getting new information, improving their knowledge, and supporting basic background knowledge to be connected. Without reading, students cannot improve their understanding of the material; they become less information and also knowledge. Thus, reading is very useful for the students in the learning process. It is stated that "reading is probably the most important skill for the student learning development because students use written texts in searching for information and acquiring new data of knowledge" [1].

Teaching and learning processes can be affected by learning materials especially in the reading classroom. In the reading classroom, learning and understanding a text can be influenced by the format and the medium of the text being read [2]. It means that in teaching and learning reading subject, learning tool helps both students and instructors to understand and comprehend the lesson. A textbook has an essential role in the courses, the students, and also the instructor."Textbooks include the essential elements of language and culture and that they correspond to learners' needs, cultural background and level of linguistic proficiency" [3]. It means textbook is one of important thing by the student in improving their ability in reading. At present, lecturers are required to be able to make and develop teaching material that can increase students 'interest in reading and can improve students' critical and innovative

thinking skills. For this reason, teaching materials need to be developed that can cover both abilities, they are hard skills and soft skills.

Teaching materials used by lecturers today especially in one of the private universities in West Sumatera Indonesia have not been able yet to create learning and teaching processes that can make an interactive classroom atmosphere. This is because; teaching materials given to students tend to be only monotonous texts. Teaching materials given to students are more oriented towards hard skills. Besides, the teaching material used is also not able to motivate students to achieve not only hard skills but also soft skills that are expected to be suitable for the learning objectives. It states that "textbook need to fulfill these criteria; 1) Textbooks should be revised from time to time to make sure they are free from spelling, grammatical and lexical mistakes; 2) An appropriate plan should be organized in which the roles of textbook developers, teachers, students, and educational managers at a specific stage of learning and teaching are stated clearly; 3) In revising the textbooks, good qualities of the textbooks should be retained and the shortcomings should be eliminated or at least reduced; 4) Teachers and supervisors should be consulted when selecting the textbook material, and they should participate in making any modifications or improvements concerning the textbooks; 5) Finally, materials development is by now an area of specialization with abundant literature[4]". These criteria above are used to develop a reading textbook subject to fulfill both hard skills and soft skills criteria in learning achievements.

Therefore, textbook writers are required to appreciate and employ principles of materials development in the process of writing and revising books. Thus, the textbook used in a reading subject needs to be evaluating, developing and also modifying for the learning process. The purpose of textbook development relates to create better lesson and to improve learning outcomes. The instructors have developed and modified a textbook for reading subject which named a Basic Reading textbook. Basic reading is not only the name of the textbook but also as the subject in reading in the first semester for English department students in this private university in West Sumatera Indonesia. It is concerned with the subject for the next level of reading course. Here, the basic reading subject is one of the important subjects and it is chosen as an appropriate textbook that is needed for teachers and students.

The textbook was organized based on multimodality and character education values. Multimodality is a combination of elements such as visual design, text style, and physical make-up. The design of the textbook consists of pictures, highlight, font colors, font style, table, graphic, etc. It is defined that multimodality as two means of representation and communication, such as still image, gesture, posture, speech, music, writing, or new configurations of the elements [5]. It means multimodality is the combination of several semiotic modes, which is nearly always present in communication. Another factor that underlying the development of this book is character education. "Character education is an action which done nationally and intentionally to create ethical, responsible, and caring young people which is actively carried out at school, districts, and states to embed important essence values such as honesty, responsibility, caring, respect, and others" [6]. The core values develop in this textbook oriented to eighteen values of Ministry of Indonesia National Education such as religious, honesty, tolerance, discipline, hard work, creativity, independent, democracy, curiosity, spirit of nationality, love country, appreciate for achievement, friendship, love peace, like to read, care for environment, care for social, and responsibility[7].

The purpose of this research is to investigate whether the use of the Basic Reading textbook can improve both students' hard skills and soft skills in reading courses at one of the English Department in Private University in West Sumatera Indonesia. The result of this research is aimed to develop a textbook which can increase students cognitive abilities, skills,

and attitudes in the learning process which is suitable with the learning outcomes of higher education program based on Indonesian National Qualifications Framework (KKNI) [8].

2. Method

This research was pre-experimental research that used One Group Pretest-Posttest Design. It was conducted using basic reading textbooks as a learning resource to improve students' learning outcomes in reading courses. The population of this study was third-semester students of English Language Education STKIP PGRI Sumatera Barat in Padang West Sumatera, Indonesia where the sample was chosen by using a cluster sampling technique. The instruments in this research were reading tests and observation. Tests are used to find out the improvement of student learning outcomes in the cognitive fields and observation is used to discover students' soft skills improvement. The technique of data analysis used One Group pretest-Posttest Design. The design of the effectiveness test uses One Group Pretest-Posttest Design, with one class used to teach basic reading in learning[9]. After that, the pretest is given at the beginning of learning and the posttest at the end of learning. Then tested using the T-Test (Paired Samples T-Test) which is used to test the average difference of more than two samples, the same data variation, but the sample is not related to one another, and it is calculated with normalized N-gain. The Normality gain score is a technical analysis to determine the level of increase in learning outcomes before using the basic reading textbook on learning and after using it. The Hake's formula [10] can be seen below:

$$\text{Normalized Gain} = \frac{Score\ (Posttest) - Score\ (Pretest)}{Score\ (ideal) - Score\ (Pretest)}$$

Gain criteria:
g > 0,7   : High
0,3 < g < 0,7 : Moderate
g < 0,3   : Low

3. Result And Discussion

There is substantial evidence that character values have been integrated in learning materials [11,12,13,14,15,16] especially in Indonesia curriculum [17,18,19,20]. Indonesia curriculum is focused on character education which is hoped can produce students who have good moral values. This research also integrated character education into learning materials which is called "Basic Reading" textbook.

The implementation of the basic reading book in reading was carried out in eight meetings. The data of the research has begun with doing a pretest to find out the initial conditions of students 'ability in reading before they use the basic reading book, then after the implementation of the book in reading the posttest is done to find out students' understanding of using the book in the learning process. The description of the result of cognitive that has been gotten from pretest and posttest can be seen in table 1 below;

Table 1.
Description of the cognitive result

Kind of the test	amount of the student	Average	Standard Error	Standard Deviation
Pretest	27	63.63	1.58	8.20
Posttest	27	80.52	1.17	6.12

Based on the data of cognitive learning outcome, it can be seen the average cognitive learning outcomes before using basic reading textbooks or pretest is 63.63 with a standard deviation of 8.20, the standard error is 1.58. Then, cognitive learning outcomes after using the basic reading textbook which has been used by students in the title with the same subjects for the results of the posttest are 80.52 with a standard deviation is 6.12 and standard error is 1.18. It means students' reading ability was increased after using the Basic Reading textbook. The result of the pretest and the posttest scores are used to determine the effectiveness of the Basic Reading textbook by using the N-Gain normalization formula. This formula is used to analyze the comparison of pretest and the postest score [10]. It can be seen in the table below;

Table 2.
Summary of Pretest- Postest and N-Gain

Score	Minimum	Maximum	Average
Pretest	50	78	63.63
Postest	66	94	80.52
N-Gain	0.26	0.86	0.46

In table 2, it can be seen that the minimum score for pretest is 50 and the maximum score of the pretest is 78 while the average score is 63,63. Meanwhile, after the implementation of the Basic reading Textbook, students' minimum score for the posttest is 66 and the maximum score for the posttest is 94 while the average score is 90.52. Based on the result of the minimum and the maximum score of pretest and posttest of students' reading ability, it can be said that students' ability in reading is improved. Furthermore, the calculation of the N-Gain Normalization result shows the average score is 0.46 which categorized as moderate. The table of classical N-Gain' result can be seen as the following table below;

Table 3.
The result of N-Gain criteria

Score range	Students	Percentage (%)	Criteria
g>0.7	1	0.04	High
0.3<g>0.7	24	0.89	Moderate
g<0.3	2	0.07	Low

Based on table 3, it can be seen that the percentage of students who classified to the high gain criteria is 0.04%, the moderate gain is 0.89% and the low gain is 0.07%. By increasing the value of the pretest and posttest, thus, the use of basic reading textbooks has been effective to be applied. To evaluate the effectiveness of using the textbook that has been implemented, hypothesis testing is done by using the t-test (t-test). The results of the t-test can be seen in table 4;

Table 4.

T-test result

Data	Mean	Number of Student (N)	T-test	P value	Criteria
Pre test	63.63	27	13.10	0.000	Significant
Post test	80.52	27			

Referring to the calculation obtained t = (13.10) with a probability of 0,000 (p-value <0.05) so that H0 is rejected. The data shows that there are significant differences between the value of cognitive learning outcomes before the application of basic reading books and after applying the textbook. Based on the average value pretest score which is 63.63 and posttest value 80.61, it is concluded that student cognitive learning outcomes increased. Improving cognitive learning relates to N-gain analysis is known that the categorization of cognitive improvement in learning outcomes is moderate so that the pretest and posttest scores are different. The results of the T-Test (Paired Samples T-Test) indicate a significant difference; the results are sharpened by improvement cognitive values of pretest and posttest.

Furthermore, the results of students' soft skills also show that students' core ethical values have changed significantly. Before implementing the Basic Reading textbook, the students were often doing their assignments individually which makes them often do cheating. It also obstructs their sense of cooperation. Furthermore, the students also late in submitting their assignments which caused by their lack of motivation in reading [21] and sometimes they did not do the assignment. The Basic Reading textbook developed to instill core ethical values to the students of the English Department of STKIP PGRI Sumatera Barat, Indonesia. The character values embedded in this textbook are based on the core character values developed in Indonesia Education Curriculum [7],[8]. The implementation of character education in colleges and schools should meets the characteristics of character education such as value-based education; college culture-based character education; and character education [22] which requires aspects of knowing the good, desiring the good and acting the good [23].

The observation shows that after utilizing this book, students' ethical values are developed. They became more disciplined, responsible and respectful students. In doing their assignments, they often do cooperatively and help each other. It means even though the implementation of this textbook does not give a significant effect on students' character values, but it can instill students' ethical values. It is because text plays a crucial place in education which contains character and moral values [24].

The results of the N-gain value explain the use of basic reading textbooks in reading subjects has an impact on improving students' thinking skills. Improving students 'thinking skills both from soft skills and hard skill is caused by the book material that contained in character education which had an effect on improving students' soft skills and also the use of multimodality which could make students interested and understand the texts they read and increase their curiosity on a topic in learning reading. The results of this study show the use of basic reading textbooks can improve student learning outcomes.

Cognitive learning outcomes are categorized as moderate from learning outcomes in using basic reading textbooks that enable students to improve their reading skills. It is caused by the contents of this textbook consists of basic skills of reading such as understanding topic, understanding paragraph, using context clues, scanning, skimming, and previewing. This textbook points the students to be able to practice their reading skills. It because in each part of this book, the students are asked to practice one reading skill. By applying a reading skill

for each chapter, the students focus to use it effectively and it will be used unconsciously while they have reading difficulty [25].

This reading textbook is also arranged to sharpen students' reading skills which already had. They are given the knowledge first and then they are asked to apply their skills in the exercises contained in this book. These exercises direct students to solve problems that instill character education values. It also aims to build up students to think critically, creatively, and innovatively in solving problems related to their surrounding environment. The result of this study shows that the implementation of the Basic Reading textbook can improve students' reading skills.

Moreover, the implementation of this textbook establishes the students in acquiring different learning experiences that they build from previous learning. They also can interact with peers, work together in expressing opinions, and do disscussion in solving problems. This book is arranged in uncomplicated and straightforward design to understand the text which serve with many illustrations in the form of pictures as examples and exercises that clarify the material contained in the textbook.

4. Conclusion

Based on the result and discussion above, it can be concluded as that the Basic Reading textbook is effective to be used. It can be seen on the results of N-gain calculations have gotten from the increase in the cognitive learning test of 0.43 which is categorized as 'Moderate'. The T-test result also shows that there is significant different between the pretest and the posstest's score of students' reading ability which means the Basic Reading textbook is effective in improving students' reading ability. Furthermore, the result also shows that students' ethical values are changed after the implementation of this book.

Suggestions

The results and the conclusion of this research retaled to improve students' reading ability and instill character education, it can be suggested that learning tool such as textbook plays essential role in the teaching and learning procees of reading subject. The content of the textbook should be designed interestingly and creatively to encourage students foster a love of reading. It is also suggested that the textbook designed should integrated character education not only in the teaching process but also in teaching materials to produce young good character people.

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