A STUDY OF INDONESIAN STUDENTS' ACHIEVEMENT BASED ON PISA

LAPORAN PENELITIAN

OLEH:
ASMI RUSMANAYANTI, M. Sc.
NIP. 19780621 200112 2 002

JURUSAN BAHASA DAN SENI
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
UNIVERSITAS LAMBUG MANGKURAT
2014
A STUDY OF INDONESIAN STUDENTS’ ACHIEVEMENT BASED ON PISA

LAPORAN PENELITIAN

OLEH:
ASMI RUSMANAYANTI, M. Sc.
NIP. 19780621 200112 2 002

JURUSAN BAHASA DAN SENI
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
UNIVERSITAS LAMBUNG MANGKURAT
2014
HALAMAN PENGESAHAN

1. Judul Penelitian : A Study of Indonesian Students' Achievement based on PISA

2. Peneliti
   b. Jenis Kelamin : P
   c. NIP : 19780621 200112 2 002
   d. Disiplin Ilmu : Education
   e. Pangkat/ Golongan : Penata/Lektor
   f. Fakultas/ Jurusan : FKIP/ Bahasa dan Seni

3. Jenis Penelitian : Comparative Study

4. Dana yang Diperlukan : Rp. 1.000.000,- (Satu Juta Rupiah)

Banjarmasin, Juli 2014

Menyetujui,

Dekan FKIP Unlam

Asmi Rusmanayanti, M.Sc.
NIP. 19780621 200112 2 002
KATA PENGANTAR


Harapan saya semoga penelitian ini membantu menambah pengetahuan dan pengalaman bagi para pembaca, sehingga saya dapat memperbaiki bentuk maupun isi penelitian ini sehingga kedepannya dapat lebih baik. Penelitian ini memiliki kekurangan, oleh kerena itu saya harapkan kepada para pembaca untuk memberikan masukan-masukan yang bersifat membangun untuk kesempurnaan penelitian ini.

Banjarmasin, Juli 2014

Peneliti
CHAPTER I
INTRODUCTION

This study aims at investigating the school effectiveness in Indonesia which could explain the outcomes of Indonesian students’ achievement on the reading, mathematical and science literacy test based on PISA data 2003 and in comparison to PISA data 2006. Chapter I as the beginning provides background of the study, objective of the study, research question, and significance of the study.

1.1 Background of the Study

Education is among the crucial components of a nation’s development. A nation, besides having natural resources, or being rich in human resources, needs proper tools that will preserve, manage and maintain such resources. Education is a viable tool that serves the need of wise, effective management of resources. Indonesia which is among the developing countries strives towards high quality education for its citizen to develop the country (Sudibyo, 2005). This can be acquired if the government and the organs that are concerned with education participate fully in the process of improvement regarding the education system.

It is unfortunately quite difficult to develop the quality of Indonesia education. It can be seen from one of the outcomes of the results of the Program for International Student Assessment (PISA) as a large international
comparison of the education quality of many countries for reading, mathematical, and science literacy. The PISA-outcomes show, for instance, that Indonesian’s students achievement of the reading assessment were below the average of the PISA results both in 2003 and in 2006 (OECD, 2007b). PISA itself is a triennial survey over the 15-year-old students are prepared to meet the challenges of today’s knowledge societies (OECD, 2005). In addition, this program also aims to measure such wider outcomes of schooling and in the mean time, assessing students’ performance in terms of reading, mathematics, and science (OECD, 2007a). The PISA study is a major policy initiative of the OECD members’ countries in organization realizes that the growing recognition of prosperity of a nation derives largely from its human capital and the opportunities for its citizens to learn and acquire knowledge on a continuing basis (OECD, 2002).

The question about the effectiveness of schools has been a challenge for educational, social, and political policymakers and researchers as well all over the world. For example, Lingard, Ladwig and Luke (1998) state that educational effectiveness is essential and it starts from impoverished idea of what count as achievement since it seems to assume that outcomes of schooling can be measured in conventional terms of skills, behavior, knowledge, and competencies. Schools are basically institutions for people to acquire knowledge and skills (education). However, to develop effective schools is not an easy job to realize, especially for developing countries, and Indonesia is not an exception to that.
Even though there are many schools in every district in Indonesia, it is unclear how to solve the problem to make effective and professional schools in Indonesia. Based on the situation of the low achievement of Indonesian students at the PISA research, therefore, a further study will be conducted to study more in-depth the situation in Indonesia and to find a solution for the problem of low quality schools in relation to students’ performance. This is the aim of this study and the reasons why a further study of Indonesian education is crucial.

1.2 Objective of the Study

This study focuses at finding out which of the school effectiveness variables work in Indonesia which could explain the outcomes of Indonesian student achievement on the reading, mathematical and science literacy test based on PISA data 2003 and in comparison to PISA data 2006.

1.3 Research Question

The research question to be answered in this study is formulated as the following:

Is there significant improvement of students’ achievement in Indonesia for Reading, Mathematics, and Science based on PISA for the year 2003 and 2006?
1.4 Significance of the Study

This study is expected to be an input for Indonesia education especially in regard to the school effectiveness. Therefore, further research and analysis of many sources related to the reading, mathematical, and science literacy field is necessary to be elaborated and to paint a picture of Indonesian education. The main reason of knowing this result is to have further information for the next step of improving the education in Indonesia. By knowing the result in general and more specifically the result for reading, mathematics, and science literacy, it is expected that the Indonesia government would be more aware and serious in finding ways to improve the education system of Indonesia.
CHAPTER II
REVIEW OF LITERATURE

This chapter elaborates the outcomes of the literature analysis related to school effectiveness, especially on the school effectiveness in Indonesian education. In addition, some information is also presented on the reading, mathematical, and science literacy.

2.1 School Effectiveness

There are major changes in the educational field. Especially in the area of educational effectiveness, a new theoretical framework should develop from time to time. According to Creemers (1992), there are three major changes in the way of thinking about educational effectiveness. The first period of changes can be situated at the start of the nineties. The first change has to do with the development of techniques and methodology. This is not only the result of educational research; in fact, it is connected with the progress in social science research in general. Secondly, it turned out that some traditional areas of educational research and educational science in general got far less emphasis than in the past. For example, curriculum studies in the past were addressed to concern the values of the curriculum, the ideas behind the curriculum, and the conceptual questions about the curriculum. On the other hand, new fields in educational science and research came up, like educational technology, the use of media and especially the whole concept of productivity and effectiveness in education. Thirdly, there has been different attention to the formation and
development of theories frameworks, theory development and conceptual analysis. The systems approach in education is thinking about inputs in education not only in terms of the background of students, but also in terms of the financing of education, other resources and the quality of teachers. Processes and inputs in education should be related to what society wants to achieve with education (Creemers, 1992).

Moreover, according to Monk (1992) there are three basic approaches used in the literature of educational effectiveness modeling. The first model is the economic approach which is focusing on estimating the relationship between the 'supply of selected purchased schooling inputs and educational outcomes controlling for the influence of various background features'. The second approach is similar to the economic approach but it focused on a different choice of antecedent conditions, since it is mainly focused on variables at students' level which are assumed to predict student outcomes. At this approach, there are two different viewpoints either from psychologist or from sociological perspective. The third approach attempts to integrate the findings of School Effectiveness Research (SER), Teacher Effectiveness Research (TER), and the early input-output studies. For this approach, it has a multilevel structure, where schools are nested in contexts, classrooms are nested in schools, and students are nested in classrooms of teachers (Creemers, 1994).

Furthermore, Creemers (1994) identifies three components within quality of instruction. These components are curricular materials, grouping procedures, and teacher behavior. Creemers's model elaborates why educational systems perform differently. The comprehensive model of educational effectiveness is
based on the assumption that the influences on student's achievement are multilevel and it refers to factors at different levels that are related with student achievement. Those factors are student, classroom, school, and system.

In addition, in an article in 2006, Creemers developed a model in which five dimensions that are related with classroom, school, and system are at the core of educational effectiveness. Those are frequency, focus, stage, quality, and differentiation. Frequency is a quantitative way to measure the functioning of each effectiveness factor at the system, school, or classroom level. Focus is the second factor that needs to be measured which reveals to the function of system, school, or classroom level. Two aspects of focus of each factor are measured. First one is the specificity of the activities that can range from specific to general. The second one is the purpose for which an activity takes place whether this activity may be expected to achieve a single or multiple purposes. Stage can be measured by taking into account at which activities take place. It is expected that the factors need to take place over a long period of time to ensure that they have a continuous direct or indirect effect on student learning. The next dimension is quality. Finally, the dimension differentiation refers to the extent to which activities associated with a factor are implemented in the same way for all of the subjects involved with it. The importance of treating differentiation as a separate dimension of measuring effectiveness factors arises from the fact that students of any age and in any culture will differ from one another. Those differences could be in various intellectual and psychomotor skills, in both generalized and specialized prior knowledge, in
interest and motives, in their socioeconomical background, and in personal styles and the work during learning (Dowson & McInerney, 2003).

Furthermore, final changes into the use and research of the concept of school effectiveness have been concluded by Creemers & Kyriakides (2006) as well. They analyze that the current model of effectiveness must cover things as follows; be based on the assumption that the relation of some effectiveness factors with achievement may be curvilinear; illustrate the dimensions upon which the measurement of each effectiveness factor. In principle, each factor that refers to the classroom, school, and system can be measured by taking into account five dimensions; frequency, focus, stage, quality, and differentiation.

The essential ideas of school effectiveness are highlighted in the theoretical background of this study, with a particular focus on concepts of "school effect" and "effectiveness". The literature on 'effective' schooling and school improvement affords a prominent place to the development of effective teaching and school leadership in its accounts of the various factors, which combine to make up an effective school (Mahony & Hextal, 1997). There are many levels involved or considered to make an effective school. In this study, it will not only involve the school, but also others, such as, from the teachers and students point of view, and the system of the education itself.

The theoretical framework of this study based upon the conceptual framework of educational effectiveness that is developed by Creemers (1994). According to the theory of Creemers & Kyriakides (2006) it is very fundamental to elaborate on the precise definition of the concept of school effectiveness. Besides, there are also some other references that are related to
school effectiveness such as Thorkildsen (2000) who writes about primary and secondary school children in general, and (Chall, 2000) who writes about the importance of teacher-student centeredness in the classroom. Moreover, this study also based on a recent study by Maulana (2007) who also conducted research into Indonesian students’ achievement rooted in PISA specifically into mathematics and the year 2003. Although, he was interested in math achievement, certain outcomes in terms of (predictors of) achievement of his report could also be of relevance of this study.

2.2 School Effectiveness in Indonesia Education

Improving the efficiency and equity of schooling depends, in large measure, on ensuring that competent people want to work as teachers, that their teaching is of high quality, and that all students have access to high quality teaching (OECD, 2007). In recent years, some major changes have taken place in the field of educational field of Indonesia.

The importance of having good, qualified and effective schools is very crucial especially for the most populated countries in this word. Ten years ago, the world’s nine high population countries (E-9) were burdened with high population growth rates and low literacy rates. Indonesia is one of these E-9 countries. Today, by lowering population growth rates and raising literacy rates all nine countries- Bangladesh, Brazil, China, India, Indonesia, Egypt, Mexico, Nigeria and Pakistan- have managed to reverse the process, defying all predictions. Together, the “nine giants” still account for half the world’s population and 70 per cent of its illiterates. However far from the widely
predicted population explosion, the nine countries have in fact registered a significant fall in population. In Bangladesh, Brazil, China and India the decrease is particularly significant, because of the sheer size of their populations. China has become the first E-9 country to achieve a 0.90 population growth rate (Unesco, 2008).

Furthermore, UNESCO (2008) promotes quality education systems at the post-primary levels by assisting policy-makers, curriculum developers, trainers and teachers to reform national education systems. Its objective is to create more learning opportunities for young people and adults and to make national program more relevant to science and technology-led societies and labor market needs while being consistent with sustainable development.

Related to the meeting of Education for All (EFA), Jusuf Kalla, the past vice president of Indonesia, said that a teacher is at the frontline of the Indonesia education System. Without good teachers, no matter how good is the blue print of the educational, it would not success. Kalla also said that the welfare of a nation depends on the economic and technology depend on the education of the nation. Therefore, the existence of teacher, especially good and qualified ones, is very crucial to improve the educational effectiveness (Kalla, 2008).

Moreover, Reezight (2001) mentioned the importance of external factors for school improvement. In her model of school improvement, she mentions that school sometimes need pressure to improve. Below is the model of effective school improvement by Reezight (2001: 33).
The reezeight –model makes quite clear that many factors are related to effective school improvement and it show that the Indonesian Ministry of Education has several possibilities to improve their schools.

2.3 Reading, Mathematical, and Science Literacy

Below are some information related to reading literacy, mathematical literacy, and science literacy.

Reading Literacy

Reading proficiency is a crucial accomplishment for everyone. It is the royal road to knowledge and it is essential to the success in all academic subjects. Furthermore, reading is one of the language skills that someone learns besides speaking, listening and writing. Reading literacy is an active process especially in reading a book. It requires a degree of active attention and engagement. Indeed, reading itself is a progressive skill that depends on years of education and practice.

Among the increasing demands placed on the educational development of citizens, reading literacy is fundamental. Reading literacy in PISA is not at all or nothing measure: rather, students are placed at different levels of proficiency according to the difficulty of task that they can complete (OECD, 2000a). Easier tasks require basic handling of simple task, with harder ones involving increasing complexity and less explicit information. To be more specific, the concept of reading literacy, based on PISA data 2003, coped the understanding of using and reflecting what someone’s has read as a tool to develop their potentials and knowledge. These skills are also needed as a tool for the students
to participate in their society. According to OECD (2000b), there are three kinds of aspects to define the concept of literacy. These concepts are reading material format, the aspect and the type of reading and the third one is the use of the text (which has constructed and in which situation that the text is used).

Mathematical Literacy

Mathematics concerns on a specific body of knowledge and the is centered in this study on such concepts as quantity, numeracy, structure, space, change and the academic discipline that studies them. The mathematician Devlin Klein maintains that mathematics is the science of pattern, and that mathematicians seek out patterns whether found in numbers, space, science, computer, imaginary abstractions, or elsewhere (Keith, 1996). At different times and in different cultures and countries, mathematics education has attempted to achieve a variety of different objectives. For example, the teaching of basic numeracy is importance for all pupils' skills. The teaching of other practical mathematics such as arithmetic, elementary algebra, plane and solid geometry, trigonometry to most pupils, is necessary to equip them to follow a trade, craft, or else (Keith, 1996).

Science Literacy

Nowadays, our world is filled with the products of scientific inquiry. Therefore, science literacy has become a necessity for everyone who needs to use scientific information to make choices that arise every day. There are some similar terms related with scientific literacy. It could mean that a person can ask, find, or determine answers to questions derived from curiosity about everyday experiences that relate to the ability to describe, explain and predict
natural phenomena. Scientific literacy implies that a person can identify scientific issues, to pose and evaluate arguments based on evidence, to apply conclusions from such arguments appropriately and express positions that are academically grounded. A literate citizen should be able to evaluate the quality of scientific information on the basis of its source and the method used to generate it (National Science Education Standards, 1995).

3.1 Method of Research

This research is a comparative study in which the main focus is the comparison of Indonesian students’ achievement in reading, mathematics, and science literacy between the 2003 and 2006.

To answer the research question, the following types of data analysis have been used such as the independent samples by t-test and it will be described more thoroughly. The independent t-test answers the first research question about whether there are any significant improvements of Indonesian students in 2003 and 2006.

In this part, the methods of the study will be discussed upon main, especially about the samples of the study. As mentioned in the previous chapter, this study makes use of the PISA OECD data of 2003 and 2006. Program for International Students Assessment (PISA) is an OECD collaborative program among many OECD and non-OECD countries. PISA, which is based on a specific model of lifelong learning focuses on measuring how well students at age 15 are prepared to meet the challenges they may encounter in their future life (OECD, 2006).
CHAPTER III

DESIGN AND METHODS

This chapter is endeavored to present the method of the study, sample size, data collection and instrument, and model of the study.

3.1 Method of Research

This research is a comparative study in which the main focus is the comparison of Indonesian students' achievement in reading, mathematics and science literacy between the 2003 and 2006.

To answer the research question, the following types of data analyses have been used such as the independent samples by t-test and it will be described more thoroughly. The independent t-test answers the first research question about whether there are any significant improvements of Indonesia student in 2003 and 2006.

In this part, the methods of the study will be elaborated upon more, especially about the samples of the study. As mention in the previous chapter, this study makes use of the PISA OECD data of 2003 and 2006. Program for International Student Assessment (PISA) is an OECD collaborative program among many OECD and non-OECD countries. PISA which is based on a dynamic model of lifelong learning focuses on measuring how well students at age 15 are prepared to meet the challenges they may encounter in their future life (OECD, 2006).
PISA assesses how far students' basic or compulsory education has acquired some of knowledge and skills that are essential to be able for participation in society. In 2000, 43 countries were participated for the first assessment. Then, there were 41 countries in the second assessment in 2003. Meanwhile, the third assessment in 2006, 57 countries were joint and it is predicted that more countries, 67 countries, will participate in the forth assessment in 2009. Moreover, in all cycles, the domains of reading, mathematical and scientific literacy are covered not merely in terms of mastery of the school curriculum, but in terms of important knowledge and skills needed in adult life.

3.2 Sample Size

Indonesia has participated in PISA since the second cycle of PISA has been defined. In 2003, Indonesia which is a non-OECD country members, participated with a high number of schools and students. There were 350 schools participating as samples of schools in Indonesia and 10761 students. There were 7284 students of public schools and 3477 students from private schools in Indonesia.

Furthermore, in 2006, there were 325 schools joining the PISA-survey and around 1674 students for both public and private ones.

3.3 Data Collection and Instrument

For data collection, this study was accomplished on the result of PISA tests which were held by OECD 2003 and 2006. The subjects of the test were
students age 15 up to 16 years old which focusing in Reading, Mathematical and Science Literacy achievement. The total participants for both years were 21,408 students which are the representative of all the 15-16 years old students all over Indonesia. The table below shows the number of students who participated in PISA 2003 and 2006 based on the school type.

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>7.284</td>
<td>6.718</td>
</tr>
<tr>
<td>Private</td>
<td>3.477</td>
<td>3.929</td>
</tr>
</tbody>
</table>

In 2006, the percentage of students who enrolled in public schools was 63.1% which is 222 public schools and 130 private schools.

3.4 Model of the Study

The data procedure is as the following. First, the OECD PISA data were selected only for Indonesia country among the 41 countries data for 2003, and 57 countries in 2006. Then, those data were analyzed to see the differences and the similarities between the students' achievement in 2003 and 2006.
CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents results of the conducted study on the differences of the result of Indonesian students’ achievement in Reading, Mathematics, and Science Literacy of Indonesia and comparable countries.

4.1 Differences in Reading, Mathematics, and Science Literacy

In measuring the differences, the PISA-results of Indonesia are compared with that of OECD Partner countries and E-9 countries. The E-9 is the world’s nine high population countries which were established as a group ten years ago. The E-9 countries are Bangladesh, Brazil, China, India, Indonesia, Mexico, Egypt, Nigeria, and Pakistan and these countries try to manage their burden of high population growth rates and low literacy rates. Meanwhile, the ASEAN (Association of Southeast Asian Nation) is also of importance as a comparative group for Indonesia. ASEAN was established in 1967 in Bangkok, Thailand by five original member countries; Indonesia, Thailand, Malaysia, Philippines, and Singapore. Nowadays, it encompasses 10 South East Asian countries which are Indonesia, Thailand, Malaysia, Philippines, Singapore, Brunei Darussalam, Vietnam, Lao People’s Democratic Republic, and Myanmar (Burma).

Looking at the PISA-result in 2003, in general, it was shown that the achievement of Indonesian students was not very good. Indonesian students
scored far below the average standard score of OECD PISA participants. For mathematical literacy for instance, with the standard OECD Average score 500, it made Indonesia (which only scored 360) one of the lowest scoring countries of 41 participant countries in 2003.

Moreover, in 2006 there were 57 participant countries and the score of Indonesian students’ achievement was much higher (M= 392.3) but still below the average score of OECD mean score. For more comprehensive, see Table 4.1.

<table>
<thead>
<tr>
<th>Rank of the country Based on the mean</th>
<th>Name of The OECD Partner Countries</th>
<th>Assessment 2006</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reading</td>
<td>Math</td>
</tr>
<tr>
<td>OECD Average</td>
<td>492</td>
<td>498</td>
<td>500</td>
</tr>
<tr>
<td>1</td>
<td>Hong Kong-China</td>
<td>536</td>
<td>547</td>
</tr>
<tr>
<td>2</td>
<td>Liechtenstein</td>
<td>510</td>
<td>525</td>
</tr>
<tr>
<td>3</td>
<td>Chinese Taipei</td>
<td>496</td>
<td>549</td>
</tr>
<tr>
<td>4</td>
<td>Estonia</td>
<td>501</td>
<td>515</td>
</tr>
<tr>
<td>5</td>
<td>Slovenia</td>
<td>494</td>
<td>504</td>
</tr>
<tr>
<td>6</td>
<td>Macao-China</td>
<td>492</td>
<td>525</td>
</tr>
<tr>
<td>7</td>
<td>Latvia</td>
<td>479</td>
<td>486</td>
</tr>
<tr>
<td>8</td>
<td>Croatia</td>
<td>477</td>
<td>467</td>
</tr>
<tr>
<td>9</td>
<td>Lithuania</td>
<td>470</td>
<td>486</td>
</tr>
<tr>
<td>10</td>
<td>Russian Federation</td>
<td>440</td>
<td>476</td>
</tr>
<tr>
<td>11</td>
<td>Israel</td>
<td>439</td>
<td>442</td>
</tr>
<tr>
<td>12</td>
<td>Chile</td>
<td>443</td>
<td>411</td>
</tr>
<tr>
<td>13</td>
<td>Uruguay</td>
<td>413</td>
<td>427</td>
</tr>
<tr>
<td>14</td>
<td>Serbia</td>
<td>401</td>
<td>435</td>
</tr>
<tr>
<td>15</td>
<td>Thailand</td>
<td>417</td>
<td>417</td>
</tr>
<tr>
<td>16</td>
<td>Bulgaria</td>
<td>402</td>
<td>413</td>
</tr>
<tr>
<td>17</td>
<td>Romania</td>
<td>396</td>
<td>415</td>
</tr>
<tr>
<td>18</td>
<td>Jordan</td>
<td>401</td>
<td>384</td>
</tr>
<tr>
<td>Rank</td>
<td>Country</td>
<td>Math</td>
<td>Reading</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>19</td>
<td>Montenegro</td>
<td>392</td>
<td>399</td>
</tr>
<tr>
<td>20</td>
<td>Azerbaijan</td>
<td>353</td>
<td>476</td>
</tr>
<tr>
<td>21</td>
<td>Indonesia</td>
<td>393</td>
<td>391</td>
</tr>
<tr>
<td>22</td>
<td>Brazil</td>
<td>393</td>
<td>370</td>
</tr>
<tr>
<td>23</td>
<td>Colombia</td>
<td>385</td>
<td>370</td>
</tr>
<tr>
<td>24</td>
<td>Argentina</td>
<td>374</td>
<td>381</td>
</tr>
<tr>
<td>25</td>
<td>Tunisia</td>
<td>380</td>
<td>365</td>
</tr>
<tr>
<td>26</td>
<td>Qatar</td>
<td>312</td>
<td>318</td>
</tr>
<tr>
<td>27</td>
<td>Kyrgyzstan</td>
<td>285</td>
<td>311</td>
</tr>
</tbody>
</table>

Moreover, still looking at the PISA-results of 2003, but now for more comparable countries for Indonesia it showed that the achievement of Indonesian students was below most of the E-9 countries and ASEAN Member countries. From the Table 5.2 below, it showed that Indonesia is also the lowest of most of the countries which are the member of E-9 countries.

First, if we compare Indonesia and Thailand, both of them are ASEAN member countries, it showed that Thailand is better than Indonesia whether in Reading, Mathematics or Science literacy. In Reading, with the result 393, Indonesia is below the Thailand which scored 24 points higher than Indonesia's score. Meanwhile, in Mathematics, while Thailand had 417 score, Indonesia only scored 391. In addition, for science literacy, Thailand got 421 score, while Indonesia only received 393. However, even though Thailand is doing much better than Indonesia, both of the countries were still below the average score based on the OECD countries.
Table 4.2: E-9 and ASEAN Proficiency on Reading, Mathematics and Science Achievement 2006

<table>
<thead>
<tr>
<th>Countries</th>
<th>Reading</th>
<th>Mathematics</th>
<th>Science</th>
<th>Type of Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>393</td>
<td>391</td>
<td>393</td>
<td>ASEAN, E-9</td>
</tr>
<tr>
<td>Thailand</td>
<td>417</td>
<td>417</td>
<td>421</td>
<td>ASEAN</td>
</tr>
<tr>
<td>Mexico</td>
<td>410</td>
<td>406</td>
<td>410</td>
<td>E-9</td>
</tr>
<tr>
<td>Brazil</td>
<td>393</td>
<td>370</td>
<td>390</td>
<td>E-9</td>
</tr>
<tr>
<td>(China) Macao</td>
<td>492</td>
<td>525</td>
<td>511</td>
<td>E-9</td>
</tr>
<tr>
<td>(China) Taipei</td>
<td>496</td>
<td>549</td>
<td>532</td>
<td>E-9</td>
</tr>
<tr>
<td>(China) Hong Kong</td>
<td>536</td>
<td>547</td>
<td>542</td>
<td>E-9</td>
</tr>
<tr>
<td>OECD Means 2006</td>
<td>492</td>
<td>498</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

Second, if Indonesia is compared to other comparable nations, such as the E-9 (high population) countries, Indonesia is still one of the lowest PISA score countries after Brazil. Some of the E-9 countries such as Mexico, China (Macao, Taipei, Hong Kong were having much higher scores than Indonesia and even higher than the average score of OECD Mean score China (Hong Kong) for example, the score much higher whether in reading, mathematics, and science literacy than the OECD mean scores.

In reading, Hong Kong 44 point higher than OECD mean scores, and so does in Mathematics for about 49 point, and 42 point higher in science. For Taipei, eventhough Taipei scores less than Hong Kong, however the scores are still better than Macao and the average score of OECD. With the score 496 for reading, Taipei was 4 point above the OECD Mean score. And for Mathematics which is 549, Taipei (scored 549 Math, 532 Science) 51 points higher than the OECD Mean and 32 points higher in Science too.

Moreover, for Macao, even though it is the lowest among the China district, Macao still scores much higher than Indonesia score and also higher than the OECD mean score. If we take the Mean of China, the reading score
will be 508 which is 16 points higher than the OECD Mean. For Mathematics, the mean for China (overall: Hongkong, Taipei, Macao) is 540.3 which is 42.3 points higher, and in science China is higher 28.3 points than the OECD average.

Therefore, if we compare Indonesia and China (Macao, Taipei, Hong Kong), there will be a huge different level and point that this country had. For reading literacy, Indonesia which only got score 393, was far lower than China which scored 508. The difference for reading literacy is 115 point. Meanwhile, for mathematical literacy, Indonesia is 149 point lower than China. Indonesia only scored 391 while China got a 540 score. Finally, for Science Literacy, Indonesia and China score were so different. Indonesia only got 393 but China got 528.3 score. It was 135 point different from each other.

Furthermore, if we compare Indonesia with others populated countries such as Brazil and Mexico, it showed that Mexico is better than Indonesia but Brazil is below the Indonesia score (see Table 4.2). Mexico, with the score 410, was 17 points better than Indonesia in reading literacy while Brazil, score 393, had the same Mean as Indonesia. Next, in mathematical literacy, Indonesia was 15 points below Mexico which scored 406. Meanwhile, the Brazil which only got score 370, was 21 points lower than Indonesia which got score 391. For the last literacy, Science literacy, Mexico was still better than Indonesia. With the score 410, it was 17 higher than Indonesia which only got score 393 However, Brazil which only scored 390 was only 3 points lower than Indonesia.
1.2 Indonesia Students' Achievement (2003-2006)

As mention in the first chapter of this thesis, one of the research questions that should be answered is about the possible improvement of Indonesia students' achievement. It is an important part of this study to find out whether there is a significant difference between the result of Indonesian students regarding to Reading, Mathematical, and Science Literacy of 2003 and 2006.

Based on the result of PISA OECD 2003, it showed that the Indonesian students' achievement was not very good and it was far below the average OECD score mean. The table below shows the students' achievement score which covers reading, mathematical and science literacy. In addition, PISA 2003 also put problem solving as one of the category of the assessment.

<table>
<thead>
<tr>
<th>Year</th>
<th>Reading</th>
<th>Mathematics</th>
<th>Science</th>
<th>Problem Solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Mean</td>
<td>384</td>
<td>396</td>
<td>363</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>10761</td>
<td>10761</td>
<td>10761</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>75.3</td>
<td>78.6</td>
<td>67.1</td>
<td>72.7</td>
</tr>
<tr>
<td>OECD Mean</td>
<td>481</td>
<td>500</td>
<td>488</td>
<td>485</td>
</tr>
</tbody>
</table>

From the table above, it showed that Indonesia students' results were far away below the average mean of OECD countries. For Reading for instance, the mean result of Indonesian students were only 384 while the OECD Mean were 481. Mathematics, with the OECD Mean score 500, Indonesia result were 138 point below the OECD Mean which was only 362 score point. Furthermore, in science, with the score point 396, Indonesia was 92 point below the OECD Mean score. On Problem Solving assessment, the Indonesian
students' score was only 363 which meant that it was 122 point below the average OECD score.

Meanwhile, based on the PISA result in 2006, it showed that there was some differences in score whether in Reading, Mathematics or Science Literacy. As it is shown below, some of the Indonesian scores were higher than the previous assessment but one part of the literacy had lower score than before.

<table>
<thead>
<tr>
<th>Year</th>
<th>Reading</th>
<th>Mathematics</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Mean 393</td>
<td>391</td>
<td>393</td>
</tr>
<tr>
<td></td>
<td>N 10647</td>
<td>10647</td>
<td>10647</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation 69.9</td>
<td>74.4</td>
<td>63.5</td>
</tr>
<tr>
<td></td>
<td>OECD Mean 498</td>
<td>492</td>
<td>500</td>
</tr>
</tbody>
</table>

The mean score for student performance in science across OECD countries, technically, was set at 500 score points and the standard deviation at 100 score points. This anchoring of the scale was implemented for the combined science scale. The average mean score and standard deviation of the individual science scales can therefore differ from 500 and 100 score points (OECD, 2006).

As we can see from the diagram above, there were slight differences on Reading and Science Literacy, while on Mathematics there was a large difference between the result in 2003 and 2006, even though all of the results were much lower when compared to OECD Means score.

Looking at Reading Literacy, if we compare the students' result between 2003 and 2006, there were slight different between those years. In 2003 the
Reading Literacy result showed 384 score and up 9 points in 2006 with 393 score points. In Mathematics, a large improvement could be seen between the result in 2003 and 2006. In 2003, the results showed that the Indonesia students' mean was only 362 score points while in 2006 it increased 29 points to 391 score points. Meanwhile, on Science, a minor degradation showed between 2003 and 2006. If in 2003 the score was 397, on the other hand, in 2006 the score decreased 4 points to 393.

From the Table 4.5 below, we can see that among three conducted assessments, only two out of three which are Mathematics and Reading have significance improvement (2-tailed significant * .00). However, in Science, the table showed not a significant improvement of Indonesian students with the 2-tailed p .92.

Table 4.5: Independent Samples Test of Indonesian Students’ Achievement in Mathematics, Reading, and Science

<table>
<thead>
<tr>
<th></th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td><strong>Mathematics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>24.765</td>
<td>.000</td>
</tr>
<tr>
<td><strong>Reading</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>24.675</td>
<td>.000</td>
</tr>
<tr>
<td><strong>Science</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>54.632</td>
<td>.000</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>0.96</td>
<td>21.36E4</td>
</tr>
</tbody>
</table>
The discussion regarding the research question there is a significant improvement of Indonesian students for Reading and Mathematics for the year 2003 and 2006 is as follow. The analysis showed that for Science Literacy, the Indonesian students were neither doing significantly better nor worse in 2003 than in 2006. However, even though there is a significant improvement for two important subjects (reading and math), the Indonesian results are still not very satisfied if we compare them to the OECD Average. Another question is how the Indonesian students’ achievement are in comparison to other comparable countries like the E-9, ASEAN (Thailand) and specific OECD Partner countries?

If we compare Indonesia to countries in the same ASEAN hemisphere (Thailand), it showed that Thailand is better than Indonesia in Reading, Mathematics, and Science. For comparison of Indonesia to E-9 countries that are also highly populated countries (Mexico, Brazil, China (Macao, Taipei, Hong Kong)), the results show that Indonesia students’ achievement is the second lowest one and just a bit better than Brazil. Finally, in comparison of Indonesia to 27 OECD Partner countries while using the PISA-2006 data, the results of Indonesia students’ achievement show that the position of Indonesia is the 21 position. This position is just better than Brazil, Colombia, Argentina, Tunisia, Qatar, and Kyrgyzstan.

Furthermore, another important research question concerns with teachers and students point of view, especially focusing on the Indonesian students’ Reading achievement. The result of PISA-2006 on Reading shows that there are more than 50% of the Indonesian students of whose proficiency in reading
are below level 1 (PISA_2006) and Level 1 position. To be precise, there are 21.8% of Indonesia students’ achievement Below Level 1 and 36.5% are the only can reach Level 1 position. It is a sad finding, because students should be familiar and accustom to read, but seems not to be the case for Indonesian students. At Below 1 level, it shows the students’ ability below 334.75 score point and for Level 1 are for students’ ability from 334.75 to 407.47 score point. This might be because the students are not encourage to read more and more to gain more knowledge that very useful their future either at school and out of school sessions.

From the Table 4.5, we can see that among three conducted assessments, only two out of three which are Mathematics and Reading have significance improvement (2-tailed significant * .00). However, in Science, the table showed not a significant improvement of Indonesian students with the 2-tailed p .92.
CHAPTER V

CONCLUSION AND SUGGESTION

This chapter aims at completing the parts by concluding and providing suggestions. It begins from a section that draws the summary of this study and ends with recommendations for the betterment of the study.

5.1 Conclusion

This study has been conducted in order to find out the Indonesian achievement in international comparison, especially in reading. Regarding the research question there is a significant improvement of Indonesian students for Reading and Mathematics for the year 2003 and 2006, the findings of this study lead to the conclusion that there is a significant improvement for two important subjects (reading and math), the Indonesian results are still not very satisfied if we compare them to the OECD Average. However, for Science Literacy, the Indonesian students were neither doing significantly better nor worse in 2003 than in 2006.

5.2 Suggestion

The established conclusion above is along with the suggestions for further researchers. As we have to keep in mind that this outcome is only based on OECD PISA data, it would have been be better if all kinds of other international assessment could also be used to see how the Indonesian students
fare like TIMMS, PIRLS, etc. For future research, next to conduct a broader analysis using more data files, it would also be interesting to conduct the same type of research again but now for current available data of PISA.
REFERENCES


