

# INDONESIAN PISA RESULT: WHAT FACTORS AND WHAT SHOULD BE FIXED?

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## Abstract

One of the most prestigious programmes employed to measure educational achievement worldwide is Programme for International Student Assessment (PISA) offered by Organization for Economic Cooperation and Development (OECD). The core objective of PISA is to provide cross-nationally comparable evidence of student performance on the skills that are judged to be important for adult life (Breakspear, 2014). PISA result for Indonesia, as one of 72 countries joining PISA in 2015, pictured the stagnancy and failure of education performance system in this developing country. Attractively, it dragged the writers to conduct this study in purposing to identify the factors probably influencing the low position of Indonesia in PISA result during its participation. Based on the analysis, teachers' quality, education system, education fund as well as educational decentralization are the most probable major factors influencing Indonesia PISA. To make this study more worthwhile, the writers also tried to seek and propose solutions bounding up with those analysed factors and education in the 21<sup>st</sup> century in purposing to be used as the reference for all elements of education in Indonesia and its stakeholders to improve the stagnancy and prevent the failure to engage with global demands in the 21<sup>st</sup> century.

**Keywords:** PISA, Indonesia PISA result, Indonesia Educational System, Education Problems, the 21st Century Education.

## Introduction

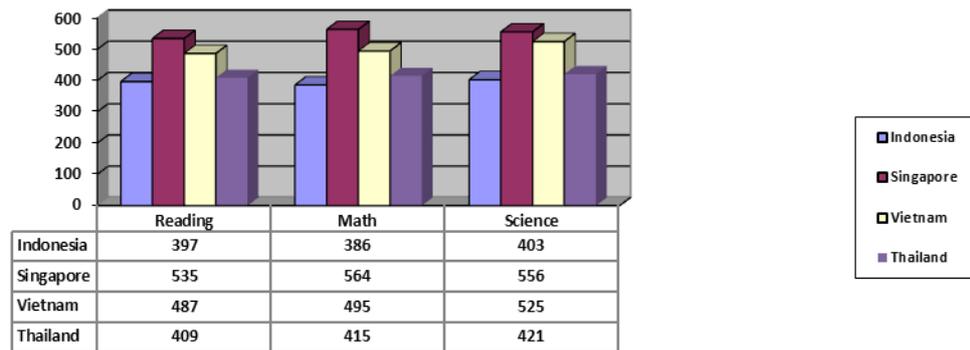
Concerning on measuring educational outcomes, the way it is measured, the effect of the result of measurement system and the policy that can probably be taken for the improvement, some organizations or institutions have created legal measurement system. One of the most prestigious programmes offered by Organization for Economic Cooperation and Development (OECD) is Programme for International Student Assessment (PISA). PISA is proposed to evaluate the assessment of scientific literacy across three competencies including process, content and situation which is conducted every three years. The core objective of PISA is to provide cross-nationally comparable evidence of student performance on the skill that are judged to be important for adult life (Breakspear, 2014). It is international comparative study of student learning outcomes in reading, mathematics and science with over 60 systems (countries) that participate in this survey. Internationally, the OECD views the ability to solve problems, to communicate, and to use information technology and scientific literacy as high priority goals for the future development of countries around the world (OECD, 1999). Science education concerns on the issues dealing with instruction and teacher training, whereas scientific literacy discusses theoretical goals and policy.

Indonesia firstly joined PISA in 2000 together with 40 other countries around the world. The number of countries joined in this program has increased as in 2006 there were 57 countries joined in. Each country or each member has to follow the procedure (standard operating procedure) which was set beforehand such as pilot project and survey, the use of test and questionnaire, determination of the population and sample, management and analysis data, and quality control. In the first participation (2000), Indonesia was ranked 39 out of 41 countries. As the number of countries joined in PISA increased, Indonesia remains to stay at the bottom five. The average score of Reading, Math, and Science are below International Score Average (500). The result can be further seen in table below:

Year	Subject	The Average Score - Indonesia	The Average Score - International	The Rank of Indonesia	Total Country Participant
2000	Reading	371	500	39	41
	Math	367	500	39	
	Science	393	500	38	
2003	Reading	382	500	39	40
	Math	360	500	38	
	Science	395	500	38	
2006	Reading	393	500	48	56
	Math	391	500	50	
	Science	393	500	50	
2009	Reading	402	500	57	65
	Math	371	500	61	
	Science	383	500	60	
2012	Reading	396	500	61	65
	Math	375	500	64	
	Science	382	500	64	
2015	Reading	397	500	66	72
	Math	386	500	65	
	Science	403	500	64	

data are retrieved from <https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf>), <http://litbang.kemdikbud.go.id/index.php/survei-internasional-pisa> and [https://nces.ed.gov/surveys/pisa/pisa2012/pisa2012highlights\\_8.asp](https://nces.ed.gov/surveys/pisa/pisa2012/pisa2012highlights_8.asp), accessed on January 13<sup>rd</sup>, 2017

The table shows that Indonesia's rank is almost as the lowest among countries year to year. Surprisingly, the newest PISA, PISA 2012 shows that Indonesia is ranked as the second lowest (64 out of 65 countries). PISA 2012 is the programme's 5<sup>th</sup> survey. It assessed the competencies of 15-year-olds in reading, mathematics and science (with a focus on mathematics) in 65 countries and economies. In 44 of those countries and economies about 85000 students also took part in an optional assessment of creative problem solving; and in 18 countries and economies, students were assessed in financial literacy. Around 510000 students between the ages of 15 years 3 months and 16 years 2 months participated in PISA 2012 as a whole representing about 28 million 15-year-olds globally. However, the result of new PISA 2015 shows that Indonesia's position among 72 country participants has risen from bottom two out of 65 countries in 2012 to the 65<sup>th</sup> in average of the three subjects. Indonesia's position is still left behind other countries, even countries within Southeast Asia Region which participate in PISA. For example Singapore, Vietnam, and Thailand as presented in the following graphic (PISA 2015):



data are taken from PISA 2015 Results in Focus (OECD 2016), downloaded from <https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf>

The graphic shows that Singapore passed the average of International Score. In fact, Indonesia is left hundreds point behind Singapore. Moreover, comparing to Vietnam and Thailand, Indonesia is still left behind. By looking to this matter, every of us must have a question in mind. What causes this? Why in fifteen years the rank of Indonesia remains the same? Later it will be further discussed in the next part.

### Findings and Discussion

Based on the data analysed through analytical literature, there are four main problems that are assumed as the influential factors of Indonesian PISA Result involving: Education Fund, Teachers' Quality and Equity, Educational System and Educational Decentralization.

#### *Educational System*

As a wide concept of national systems in every country especially Indonesia, it is not easy to operationalize and organize education system. Some studies, including KEDI (2010) and Borgonovi (2012) (cited in Chool and Hye, 2014), maintain that education system is associated with students' academic achievement and educational competitiveness. Relating to educational system of Indonesia, Ramly (cited in Hidayat and Elizabeth, 2013) proposed several critical issues of education in Indonesia such as inadequacy of evaluation system, authority of education implementation for region which faces divergence, the low teachers' ability and competency in acquiring learning material, the degradation of education orientation in which change the focus only on knowledge transfer without considering moral and behavioural aspects. Thus, in general, it can be claimed that there is the emergence of education problems such as:

#### *Learning purposes*

Teaching and learning goals deal with the expected outcomes having by students after the teaching and learning process that should be in line curriculum. Unfortunately, washback phenomena showing that the purpose of teaching has been interchangeable with the purpose of testing probably emerge along with the process of learning. Washback effect might be negative as it will disturb the teaching and learning process (Sukyadi & Mardiani, 2011). For example, the purpose of teaching has changed from teaching language skills to practicing the test. However, education in this era is expected to prepare students to face workplace, and citizenship. Education does not only focus on gaining knowledge but rather it is a tool for students to achieve success in their learning, work and life (Suherdi, 2012). To gain those outcomes, teacher should established 21st century learning framework which include academic knowledge, specific skills, expertise, and literacies. For English teaching and learning process, it purposes to develop deep understanding of English as communication tools.

It is believed that in conducting teaching and learning process, teacher should associate the materials of core subject with issues that developed in society, or it is called as 21 century themes. It is done to make students not only get the knowledge of core subject but also apply the knowledge to their real life. Besides, students' academic knowledge, students are also required to developed specific skills, expertise and literacies during the teaching and learning process in school. Those skills are life and career skills; learning and innovation skills, and IMT (Information, Media, and ICT) literacy skills. These skills are developed in order to make students ready to life in more complex life and work environment.

### *Learning process*

Teaching and learning process should be designed as interesting as possible and as motivating as possible so that students will have great motivation to attend school and to learn effectively. Therefore, we need to change our common paradigm from the paradigm that learning is only about listening, making note and memorizing to the paradigm in which learning is a student-centered process which sets out a joyful learning. Dealing with PISA indicators, our system of education still concerns on the formula of knowledge itself without considering its context on its implementation in society; for example, as PISA requires students to analyse table or data and relate it with the context, meanwhile teacher usually stresses it on how to create data and apply the formula rather than guide them to develop their critical analyses or to train them to be problem solver and creative learner. Teaching is not only delivering knowledge, or being told to do something. Teaching makes students' mind open about social justice and be ready to face workplace and citizenship.

One of domain that assesses by PISA is reading literacy. It does not focus on technical reading ability such as reading speed. However, PISA tries to find how much students can analyse the text given in relation with their daily life. PISA tries to assess students reading ability deals with these dimensions, "retrieve texts and access them, interpret and integrate texts, reflect and evaluate texts" (OECD, 2014). Unfortunately, based on PISA reading literacy result, it is only 37% of students could answer the problem correctly, and the rest 63% of students had difficulties in answering the question including Indonesian students. It might because of several factors. First, the problem like what presented above does not only required students to read, but rather they have to think and analyse the problem, then draw a conclusion from it. Students are expected not only to read, but also to find information through analysing and concluding what they have read from the data showed. Therefore, ability of reasoning should be trained to students. It also might be happened because of lack of reading habit the students are not familiar with how the text is presented. However, the more we read from many resources, the more easily we understand information presented because our brain have been trained to solve any problems related to gain meaning. As it told by Miller (cited by The Guardian, in The Jakarta Post Online; March 24, 2016) that "literate behaviours are critical to the success of individuals and nations in the knowledge-based economics. Societies that do not practice literate behaviour are often squalid, undernourished in mind and body, repressive of human rights and dignity, brutal and harsh".

As education paradigm has evolved into something that we called 21st century education, learning language is not only focusing on building students listening, speaking, reading, and writing skills but also on building and developing critical thinking, good communication, good collaboration, and be creative in order to survive in this global world (Partnership for 21st century skills, 2007). Therefore, 21st century deals with student centred learning. Student in this century is known as a native of

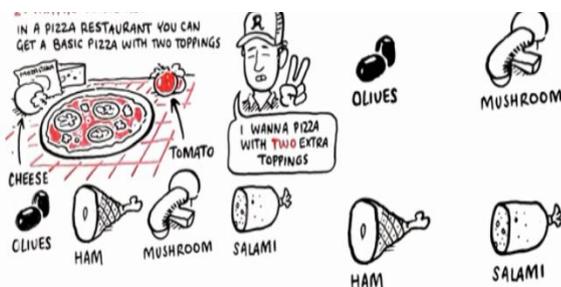
technology and internet. As a modern teacher we should adapt with this kind of circumstances rather than avoid them. We need to associate technology with our way of teaching. As stated by Shyamlee & Phil (in Cakir 2015), technology provides both auditory and visual sense of students that will help them understand both written and spoken language. Technology also influences how literacy is presented. Traditional literacy is performed in a printed material like a book. But today it is performed in multimodality by several of media, such as web page, videos or film, picture book, etc. According to Suherdi (2015) and Anstey and Bull (2010), they described that multimodal text is a text which combines two or more semiotic system by emphasizing on semiotic systems in form of: linguistic (vocabulary and metaphor), audio (music and sound effect), visual (color, moving images, and vectors), gestural (gestures or movement, body language, and emotion or facial expression), spatial (proximity, direction, position of layout and organization).

By the existence of multi-modality and multi semiotic text, it seems that conveying meaning of the text is more complicated, yet, initially, it provides more sophisticated way in analysing certain text. It also eases us to find other related information by clicking the cyber hyperlink in the website layout of the video. Besides multimodality text will provides different learning style of students because it covers four learning styles namely auditory, visual, audiovisual, and kinaesthetic.

### Learning evaluation

Evaluate the learning process is important to be done. The result of evaluation is done as a reflection both for teacher and students about their performance. However National Examination as one of success indicators in measuring national system of education is still controversial. It is because it only assesses the cognitive dimension of students meanwhile, cognitive dimension covers wide dimensions including the ability of researching, analysing, assessing, identifying, solving problem, and other critical abilities. Therefore, National examination should be revised except for the importance of mapping and selection not for graduation requirement.

In addition, most of problem stated in national examination only assess recognition knowledge, in which it only require memorization instead of analysis. On the contrary, PISA survey is designed to investigate whether or not students could apply knowledge that they have gotten in school in real life situation and problems. The form of the question can be compared as below:



Picture 1 example of PISA Math. Qusetion 1.  
(EduSkills OECD, 2011)

As the example of problem in math that has been presented above, students were asked to apply their ability in math to

6. Hasil dari  $\sqrt{54} - \sqrt{24}$  adalah ....
- A.  $\sqrt{6}$
  - B.  $5\sqrt{6}$
  - C.  $9\sqrt{6}$
  - D.  $10\sqrt{6}$

7. Hasil dari  $\left(27^{\frac{1}{2}}\right)^{\frac{2}{3}}$  adalah ....
- A.  $\frac{1}{9}$
  - B.  $\frac{1}{3}$
  - C. 3
  - D. 9

calculate how many combinations that can Roze choose. It might consider rather difficult questions since there is only 49% of students could calculate correctly that there are six different combinations of toppings were possible to be chosen by Roze. Indonesian students might have difficulties in answering the questions, even in understanding the questions. They might be confused about what to do with the problem because of lack of analysing problems had by the students.

The standard and assessment program should be developed to cultivate critical thinking, problem solving, collaborative working, interactive communication and creativity (Suherdi, 2012). Students' assessment is used as a part of learning, both for teacher and students: as a reflection of their teaching, as a measurement of the achievement learning objectives, as a reflection of students' understanding of particular materials and as a source to identify students' strengths and weaknesses in a certain subject. In consequences, it is important to consider assessment that involve students reasoning, rather than require students to memorize a bunch of facts. It also important that teacher does not mislead between the goal of learning and the goal of assessment. It should be avoided that it will make students cannot complete their learning and it seems that the learning process will be in rush.

### ***Curriculum.***

Curriculum is supposed to be contextual, dynamic and flexible, yet it is not suggested to be changeable. Unfortunately, it happens in Indonesia. The curriculum changes for a very short period. On the other side, we need long time to identify, know and experience the changes, whether it works or not, whether it makes its success or not and even whether it meets its needs or not. So, the considerations including its weaknesses and strength that can be used as the indicator to evaluate can be improved or succeed based on the factors that probably affect it.

Curriculum and instruction should develop all relevant knowledge and 21st century themes; and also specific skills, expertise and literacy. In English education it is important to build teaching and learning process which is communicative and meaningful. As curriculum is mostly applied by teacher, it is important to involve all aspects of educator and academician, especially teachers in curriculum development. The involvement of teachers in curriculum teamwork should participate in creating, developing, socializing, and monitoring the curriculum. Developing curriculum should be involved by the one who will execute it in the classroom. Teachers are the one who knows the condition and need of students. Teacher also the one who understands how students learn best. Besides, in order to get prevalent information about curriculum, the socialization should be done long time before the new curriculum is going to be implemented. Monitoring (e.g. assessment) the implementation of new curriculum is also important to be done by the authorized people to make sure that everything is going well as planned.

### ***Education Funds***

The position of education in a country is very essential. Thus, Education funds allocated by Indonesian Government cited in The Constitution of National Education System in 2003 (Undang-Undang Sistem Pendidikan Nasional 2003) Article 49, Verse 1, that education budget must reach 20 percent of the total budget expenditure for each year (Kemristekdikti, 2016). Furthermore, in Article 31, Verse 4 of Indonesian Constitution of 1945 (UUD 1945) as stated by Mulyadi (2010), this country should allocate minimum education fund around 20% of The Indonesian Budget or Regional Government Budget (APBN/APBD). Data taken from Ministry of Finance (Depkeu,

2016), shows that the budget for Education sector remains constant from 2014-2016 in 20%, 20.6%, and 20.1% respectively. The budget for 2016 also shows that 148.48 billion Rupiah (35.2%) was used for Central Government expenses by ministries such as Ministry of Education and Culture, Ministry of Research, Technology, and Higher Education, Ministry of Religious Affairs, and other State Ministries. Another 267.9 billion (63.5%) was used to allocate funds for Local Government, and the rest (1.3 %) is used for other expenses. From this allocation, it can be seen that the expense on Education sector is still low comparing to the coverage area of Indonesia. As stated above that minimum budget for education is at least 20%, therefore, Indonesian Government should increase budget for Education sector from year to year to fulfil education sector's needs. Unfortunately, as cited in Kemenkeu (2017), 2017 budget remains constant at 20% (416.1 out of 2.080.5 billion rupiah). Besides, management of the budget for each sector must be well-maintained. As Ashari (2014) mentions that education funds are used for various purposes such as scholarship for under privilege students, rehabilitation education facilities, teachers' aid, teachers' salary, endowment fund, rehabilitation education facilities which have been damaged by natural disaster, etc. Thus, in order to create better education for Indonesia, budget for education must be appropriate to cover whole national education needs with all consequences.

### ***Teachers' Quality and Equity***

To be a teacher, it is required to keep updating towards knowledge, skill, information, news, etc., that support his/her education carrier. There are a lot of ways that teachers should do, besides continuing their study into master and doctoral program, it might be attending training and seminar about education, for example; In House Training, MGMP (*Musyawarah Guru Mata Pelajaran*), KKG (*Kelompok Kerja Guru*), TOT (Training of Trainer), and PLPG (*Pendidikan dan Pelatihan Profesi Guru*) in which these forum help teacher to discuss about the latest issue of curriculum, education system, education information, objectives of each subject, also these forum can help teachers share their experiences on how to handle and to treat students in different situations based on what 21<sup>st</sup> century needs.

In 2015 Indonesian government already conducted *Uji Kompetensi Guru* (UKG) in which the result was released in early 2016. UKG tests consists of 60 questions and covers two skills; professional and pedagogy (10 modules). Based on the result, it shows that most teachers are still below standard required, the national mean is 53.02, mean for professional skill is 54.77 and pedagogy is 48.94, while the passing grade should be 55 (Kemendikbud, 2015). The following up program based on UKG score is IN (*Instruktur Nasional*) and GP (*Guru Pembelajar*). IN requires the minimal UKG score is 70 and at least 2 modules are failed. Then, IN is intended to guide their friends as GP to remedy their failed modules. Suherdi (2013) stated that teacher should master four main competences to develop students' achievement in near future:

1. Professional competence, it requires teacher to master in all genres (5 genres) as stated in curriculum. Moreover, teachers have a good ability in English to deliver all material based on curriculum to students.
2. Pedagogy competence, means teachers comprehend in creating a conducive learning process in every class situation and condition. Each student is different, each student is unique, each class is not the same to another, and then it takes teachers' ability and energy to handle these differences.

3. Personality competence, it requires teacher to have a good personality based on accepted norm in society where they live. Teachers' personality should be honest, discipline, hard worker, communicative, cheerful, helping, and so on. Teachers should be a role model and inspire their students.
4. Social competence, teacher should have a good social relationship among students, co-workers, principle, students' parents and society.

Another factor is the differences of infrastructure among provinces in Indonesia. Since Indonesia is a large country with thousand islands ranging, it seems too hard for the stakeholders to provide a good infrastructure and equal education's facilities for each region in this country. This far of distance brings the difference in infrastructure between schools in urban area and rural or remote area. In addition, other problems such as the lack of road access to school, power system which only relies on solar system and textbook relatively occur in rural area. This condition drags teachers to be more creative, innovative, critical and be agents of change in their school who lead students to develop students' critical thinking, motivate them, build their curiosity to deal with problem in any difficult condition and educate students' to face the challenges.

### ***Educational decentralization***

Referring to the educational decentralization which are relatively new issue in Indonesia, the striving to increase public sector efficiency has produced a vigorous theoretical literature on the channels that may affect it, one important such channel being the design of decentralization across the levels of government. According to (Firman and Gatti, 2002 cited in Chool and Hye, 2014), "it has argued that centralization undermines government efficiency, whereas decentralization enhances quality of government." Fundamentally, it appears as an alternative solution in managing and controlling educational system in Indonesia. Besides, it is intended as a commitment manifestation of policy makers of education in order to empower stakeholders and also to enhance the accessibility and relevancy of education. Thus, it deals with the authority delivery to each region and each level of educational implementation. Regarding with this business, Indonesia gives line to all regions and even schools to organize their own educational implementation and development. According to Belen (cited in Sindhunata, 2000 in Musanna and Bahri, 2011) the implementation of decentralization stressing on authority distribution in making policy, education proposes five hierarchical levels: National, Province, and Regency, Sub district (school group) and School. It could sound since every school can arrange, organize, manage and control their own plan based on their needs. It is because every area or region or even every school has its own characteristics in terms of geography, economy and autonomy.

Table of Curriculum Development in Centralist System and Decentralist System

Dimension	Centralization	Decentralization
Education Aims	A clear framework of the national aims of education.	No consensus regarding to the aims of education applied nationally.
Curriculum Existence	Curriculum as a result of a national system of education.	Curriculum as the stimulus towards the change of national system of education.
Policy of curriculum development	The policy of curriculum development is determined by central government.	The policy of curriculum development is offered to board of education, regional government, university or school.
The	Curriculum is applied by central	Curriculum is applied by each region,

implementation of curriculum development government, regional government, university or school as participant.

The strategy of curriculum development Curriculum is organized by curriculum planner and designer from central government Curriculum is organized by curriculum department in each school

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*Sources:* Soemantri (1993) cited in Musanna and Bahri (2011).

Therefore, it is undeniable that the concept of educational decentralization has brought bright expectation to all elements of education. Unfortunately, practically, several weaknesses has come up along with the strengths such as: 1) Inequality of the readiness of government in each region to run this system especially for government in rural and remote areas; 2) Inequality of the regional government ability to control and manage financial highlight for education needs; 3) Lack of the regional government ability to control and manage the educational development in their region by considering the characteristics of the region itself; 4) Lack of clarity of the issue expense system for education; and 5) Inextinguishable issues of corruption and nepotism in education environment in each region. These weaknesses probably bring two main threats to educational environment: 1) Inequality of national educational achievements since the emergence of various quality in each educational institution whether one region or comparing with other regions in Indonesia (interregional). This situation impacts the result of PISA since the samples (students) are randomly taken from all regions of Indonesia. 2) Inequality of teachers' competence and professionalism (quality) in every school. In consequences, we need to consider some ways that might assist us to minimize the bad effect of the implementation of decentralization of education in Indonesia based on teacher's point of view such as: 1) We need to be wide-awake of and aware of the essence of decentralization education in which authority as an obligation given to us that must be put as one of our top priority; 2) We have to open our eyes with our environment particularly school environment including society surrounding school, school physical condition, students social background, students' characteristics, students' needs, curriculum, and school capabilities to deals with the needs and policy that will be applied; 3) Teachers are demanded to develop their skills and competency; 4) Teachers should be able to analyse their own needs based on the variables affecting; 5) Government and stakeholders should tightly control and regularly evaluate the implementation of this policy; and 6) It would be better to involve teachers and students in planning, developing, conducting, monitoring and evaluating all education policies.

Thus, it can be assumed that the most critical problem in implementing educational decentralization extremely relies on the quality of human resources in which these resources have authority and obligation to implement this policy. Decentralization demands the readiness and professionalism and competency ripeness of all implementers of education and its stakeholders.

### **Conclusion**

This study reveals four main factors which affect the stagnant position of Indonesia in PISA during its participation: Education Funds, Teachers' Quality and Equity, Educational System and Educational Decentralization. These factors can be used as the references for all education practitioners and stakeholders to develop alternative ways to overcome the stagnancy. Although PISA result cannot be used as the rigid indicator of the success of education performance and achievement, all elements of

education cannot blind their eyes on those problems and challenges emerging, specifically in this 21<sup>st</sup> century. Education should be conducted in line with the characteristics, demands and needs of this century. All elements and stakeholders should think critically to the wider circles of alternatives probably or potentially applied to bring better education in Indonesia. However, it will become a new threat if all elements and stakeholders cannot build a harmonious collaboration in developing, managing and controlling educational process to go along with the national objectives. Since the success of national objectives achievements are reflected by the success of each region or area in one country, it is unarguable to say that the improvement should be done in hierarchical system started from the smallest element or scope of education itself, that is school to the widest scope, that is national. Therefore, as this study covers general factors or variables, it is suggested for further reasearch to conduct a study about the most significant factors that cause PISA result in Indonesia by identifying the specific problems or challenges faced by every district or area as each area grows and lives with different situation and characteristics.

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