

# Differentiated Instruction Approach On Natural Science Lesson For Slow Learners At Inclusive Primary School

Sigit Prasetyo, Zuhdan Kun Prasetyo, Mumpuniarti

**Abstract:** The objective of this research is to find out the differentiated instruction approach found in Natural Science lesson for slow learners at inclusive primary schools by considering the following things: 1) Assessment and prevalence of slow learners of other Special Need Children types, 2) curriculum use, 3) lesson plan, 4) learning implementation, and 5) learning evaluation. This research utilized qualitative research type. The research setting was at State 30 Primary School Palembang, Indonesia. The research subjects were: headmaster, teacher, and students. The data collection techniques were observation, interview, and documentation. The data analysis utilized data reduction and presentation, and conclusion drawing. The data validation test utilized triangulation method. Based on the result, differentiated instruction approach on Natural Science for slow learners at inclusive primary schools which was carried out at State 30 Primary School Palembang as the national inclusive education model school, it is found that: 1) the assessment is done independently and has not cooperated with the regional education service or psychological experts. The result shows that the highest prevalence of slow learners is 55.65%. 2) The curriculum utilizes combination between KTSP and curriculum 2013 which are still classical and do not have special modification; 3) the Lesson Plan utilized by the teacher is classical and has not been modified based on the students' need and diversity; 4) the Learning Implementation utilize peer tutor strategy with affection, dynamical grouping and intensive communication with parents related to the slow learners' learning development through WhatsApp or meeting with the students' guardian; and 5) the Learning Evaluation uses authentic evaluation and additional task as the remedial substitute.

**Index Terms:** Differentiated Instruction Approach, Natural Science Lesson, Slow Learners, Inclusive Primary School.

## 1. INTRODUCTION

Education has a very crucial role in determining the Human Resource quality (Armiati et al, 2019;31). Inclusive education is an education implementation system which provides an opportunity to all students who have disorder and special intelligence potential and/or talent to join the education in an education environment together with ordinary students (Permendiknas, 2009: Article 3 paragraph1). While the objectives of inclusive education are to provide as wide opportunity as possible to all students who possess physical, emotional, mental and social disorder or special intelligence or talent to obtain qualified education as their needs and ability, implement education implementation which appreciates diversity and is indiscriminative for all students (Permendiknas, 2009; Article 3 Paragraph 2). There are some things that should be noticed to be effective inclusive school. Loreman (2007) perceived that there were seven pillars to make inclusive school effective. One of them is the implementation of activities in classroom and school, flexible curriculum and pedagogic aspect. It should be noticed in inclusive school context that class learning implementation should have special strategy so that the objective of learning can be achieved by every Special Need Child. Besides, the curriculum which is used should be more flexible and based on the curriculum preparation that is based on the students' assessment or need result. (Loreman, 2005).

Inclusive education implementation program should be supported by all parties, including school boards, headmaster, teachers, parents and students. The teachers minimizes the obstacles of Special Need Children so that all students participate in the learning. The curriculum material, learning preparation and assessment procedure should be relevant with the individual need and ability by considering children's limitation and disorder. Supporting teachers and staff should be trained, for example through education and training, workshop, seminar, or short courses (Valeo, 2008). Inclusive education implementation in Indonesia experiences many basic problems which emerge such as the lack of teachers' understanding concerning inclusive education, schools administration and Human Resource in the inclusive education implementation are not ready, and the lack of support and cooperation from various parties, the lack of facility and infrastructure provided by the government related to the inclusive education implementation (Nisa Tarnoto, 2016). Furthermore, Nisa Tarnoto summarized the components that should be involved in the inclusive education implementation are: (1) school involvement, such as teachers' competence in handling Special Need Children, supporting parties e.g. psychology, Special Assistant Teachers, students, inclusive school curriculum, (2) societies' involvement, e.g. parents and public societies, (3) Government, e.g. government policy, training to improve the teachers' potential, facilities and infrastructures to support inclusive schools, clear rules about the inclusive school implementation and curriculum. General or regular education implementation in Indonesia until present tend to be classical which is carried out to serve as many students as possible. According to Tomlinson (2001), the learning model followed one size fits all pattern. This pattern causes special need children who study at regular school cannot follow the learning optimally. Even, the researchers have identified a number of factors which contribute to bad achievement for students with special need compared with ordinary students (Cole & McLeskey, 1997). Furthermore, bad achievement for students with special need is caused by the

- Sigit Prasetyo, Zuhdan Kun Prasetyo, Mumpuniarti
- Student of Post-Graduate Educational Sciences, Yogyakarta State University, Indonesia
- Science Education, Yogyakarta State University, Indonesia.
- Special Education, Yogyakarta State University, Indonesia.

teachers' experience or ability to modify the curriculum appropriately as the students' need and education learning methodology and resource have not fulfilled it (Villanueva, 2012). Almost all classes in Indonesia apply the class selection based on the different age, initial ability, and learning style of students. One of the relevant learning approaches is Differentiated Instruction (Iskandar, 2016:48). Differentiated Instruction (DI) approach is away to adjust the instruction with the students' need in order to maximize each student's potential in the scope given. DI approach is appropriate with the curriculum 2013 formulation that reduce the Graduates Competence Standard of Students' need. Curriculum 2013 which is applied demands teachers to bravely select or determine action and face risk to leave the education quality. It means that teacher as the first person will act as the curriculum developer who is familiar with the students' characteristic and learning pattern developer that is appropriate with lesson and students' characteristics (Fatimah, 2016: 14). Based on the data of Social Ministry of Republic Indonesia (Yachya Hasyim, 2013: 113), in 2011, the numbers of special need children in Indonesia reached 7 million people or approximately 3% of total numbers of Indonesian citizens. Most of them are slow learners, autistic, and mentally disabled children. Although it is high in numbers, slow learners' existence in the classroom gets little attention because of its obstacle which cannot directly observed. Slow learners do not have physical difference with other normal children. Their obstacle will appear after they join learning process. State 30 Primary School Palembang is located in Sei Tawar Sub-district, Palembang city, Indonesia. It's an inclusive primary school which also becomes national inclusive education model. As said by Nuraini as the school principal, since 2013 this school has been trusted as an inclusive school. The success of State 30 Primary School Palembang to become an inclusive school makes it to become national inclusive education model (Palembang-pos, Wednesday 31<sup>st</sup> October, 2018). Furthermore, Nuraini said: "I was asked to represent South Sumatra to join some workshops in Bandung. Teachers who came from Bengkulu, Bandung, Curup, and Bangka had ever performed their on job training here to study," she said. At present, 124 of 750 students of State 30 Primary School are Special Need Children. "Some of them are autistic, handicapped, mute, deaf and low IQ children," she explained. These students get equal treatment as other students. However, they are differed in the assessment system. "Normal students have assessment standard score 10, but the Sepecial Needs Children's standard is 5." It is strengthened by the data of assessment process documentation performed at school. The data list of Special Need Children is presented on Table 1:

**TABLE 1**  
SPECIAL NEED CHILDREN LIST AT STATE 30 PRIMARY SCHOOL

GRADE	SPECIAL NEED CHILDREN TYPE						NUMBERS/ GRADE
	HYPER ACTIVE	AUTISTIC	SLOW LEARNER	LIGHT PHYSICAL DISABILITY	DOWN SYNDROM	LOW VISION	
I	3	5	1	1	0	0	10
II	10	5	16	0	1	0	32
III	2	8	10	1	0	0	21
IV	3	6	21	1	0	0	31
V	0	5	12	0	0	0	17
VI	0	3	9	0	0	1	13
<b>TOTAL</b>	<b>18</b>	<b>32</b>	<b>69</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>124</b>

(Source: Of 124 Special Need Children, 69 focus on slow learners because they have highest numbers than other types of Special Need Children. Slow learners are included in

Special Needs Children who suffer from IQ limitation, so they experience some obstacles in the learning process. It causes the low slow learners' study achievement (Depdiknas, 2007:15). One of the characteristics is the obstacle of concept and abstract thinking mastery (Reddy, 2006:6). Whereas, the concept and abstract thinking mastery is a very crucial thing and emphasized on one of primary school lessons, which is Natural Science. This base is utilized by the researcher to observe Natural Science lesson for slow learners. Natural Science at primary schools emphasizes on the actors to play active role, have mobility competence, are able to explore the natural surrounding and further development in its implementation in daily life. Whereas, teachers have not fully accommodated the needs of slow learners concerning Natural Science learning. Besides, the curriculum utilized is similar to regular students' curriculum and students are considered as learning object, not subject. A solution should be found to solve the problems faced by the slow learners. If it is ignored, slow learners will be left behind by ordinary learners. Therefore, the researcher is interested in observing: "Differentiated Instruction on Natural Science lesson for slow learners at inclusive primary schools."

## RESEARCH METHOD

The research utilized qualitative research type which was aimed to find out the image of differentiated instruction approach on Natural Science lesson for slow learners at inclusive primary schools. The research was carried out at inclusive primary school in Palembang Indonesia. The data collection techniques were in forms of interview, observation and document which were performed by the researcher for some meetings done on October, in Academic Year 2018-2019. The research subjects were: school principal, teachers, Special Assistant Teachers and students. In order to get representative subjects, this research utilized purposive sampling technique. It means that the sampling collection was done with certain consideration and criteria. Therefore, it is expected that the data collected from the research subjects could be representative to provide an image towards differentiated instruction approach on Natural Science lesson for slow learners at inclusive primary schools. The main data source utilized direct data collection instrument. While the additional data utilized documentation collection instrument. Therefore, the data collection technique utilized observation, interview and documentation technique. The data analysis utilized Miles-Huberman's model interactive analysis, which was: the process was started from data reduction, continued with data display and conclusion drawing and verification.

The data validation checking in this research utilized both technical or source data triangulation. Technical triangulation means the researcher utilized different data collection to get the data from similar source. The researcher utilized participative observation, in-depth interview and documentation for similar data source simultaneously.

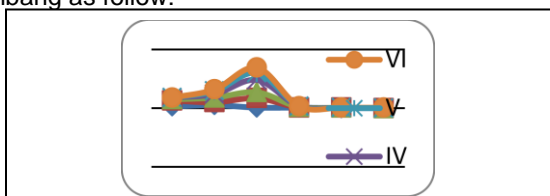
## RESULT AND DISCUSSION

Based on the result data of research which was done at State 30 Primary School, Palembang, there are some things that should be discussed in this research, e.g.:

### 1. Assessment of Special Need Children Type of Slow Learner

Of some data collection process, the data collection which was done with interview, observation, and

documentation, the researcher started the process by digging information which was relevant with the assessment process towards Special Need Children at State 30 Primary School Palembang. Based on Nuraini's explanation as the school principal, the assessment process towards the Children was done when they were accepted at the school. As said by her that: "The students should register, then the assessment process can be done towards the special need children. The process is done because my education background is psychological science. Besides, I have also obtained knowledge through upgrading activity concerning Special Need Children at inclusive schools." It is similar with one of teachers' statement, Emma, which stated that the assessment process is done in the beginning of students' registration. Approach process will be also done every academic year change and continued with continuous assessment. She also explained that the assessment process is done by the school after the student is accepted through new students' registration system and in every academic year change, started from Grade II to VI. Furthermore, Emma said that until present, the assessment process towards Special Need Children have not reached cooperation with either Education Service or psychological expert. She said that: "We identify ourselves. For example, we observe ourselves. In which type is the student? In which group? And how do we handle him/her?" The assessment which is performed by school based on the teachers' knowledge obtained after joining the upgrading activity, it is also presented by Emma that the assessment is performed from the knowledge obtained by the teacher who join upgrading activity for inclusive children until four meetings that discuss: 1) identification of Special Need Children case, 2) how to examine it, 3) how is the teaching method, and 4) how to evaluate it. Based on the information of school principal, the numbers of student at 30 State Palembang are 750 students and some of them are 124 Special Need Students who are distributed from grade I to VI. It is strengthened by Emma's explanation that Special Need Children who are accepted to study suffer from light disability, for example hyperactive, light mental disability, syndrome, low vision, slow learners, slow speakers, while severe disability is referred to Extraordinary School, such as blind. After the school obtains assessment data, they will equally divide based on each grade need. Emma said: "We gathered some people so they were accepted on the first registration, then we divided them. For example, we accept four classes, then we divided them equally based on each grade need and given to the homeroom teachers." Then the researcher process the data to find out the Special Need Children at State 30 Primary School Palembang as follow:



**Fig. 1.** The prevalence of special need children at state 30 primary school Palembang.

Based on the assessment process, the prevalence of slow learners, which is 55.65%, autistic is 25.81%, hyperactive is 14.52%, light physical disability is 2.42% and down

syndrome or low vision is 0.81%. Every grade always have Special Need Children. The high prevalence and existence which cannot be identified directly by teachers demand them to have preparation concerning the existence of slow learners in the class. However, in some inclusive schools, teachers' preparation to handle special learning and education for slow learners has not been optimal. It is understood that generally teachers do not study about special education deeply and have not been trained in the collaborative competence and special competence mastery concerning special education for slow learners. Based on the interview result, majority Special Need Children's parents come from middle-upper class family. One of the causes is lack of parents' affection in which they live and nurtured by housemaid. Parents' business reduces the meeting intensity with the children.

## 2. Curriculum Application

The curriculum which is applied is the curriculum combination between KTSP and curriculum 2013. It is similar to Emma's statement that the curriculum is combination between KTSP and Curriculum 2013. Grade III and VI use KTSP curriculum. While Grade I, II, IV and V use curriculum 2013. The curriculum content such as in competence standard, core competence, basic competence or learning indicators have not been modified as the various children's need.

## 3. Differentiated Instruction approach on Natural Science Lesson for Slow Learners at Inclusive Primary Schools

### a. Lesson Plan

According to Emma, the syllabus and Lesson Plan which are utilized in Natural Science learning for slow learners are similarly arranged with general students. The difference is seen on the assessment which is adjusted with the children's need or ability. It is because the classical learning and the school is public school. Classical Lesson Plans which have not modified are utilized by the teacher to perform Natural Science learning. One of the causes is the lack of technical training activity or upgrading which provides teachers' provision on how to modify Lesson Plan, especially for slow learners. It is expected that after joining the event, teachers who teach at inclusive primary school do not find difficulty in modifying the Lesson Plan. The Natural Science concepts in the Lesson Plan should be widely based and do not focus on small details or unlimited fact. Teachers should focus on concept, principle, and skill that should be learnt by students. The teaching content should discuss same concept with all students but it is adjusted with the complexity for various students in the class.

### b. Learning Implementation

On the initial stage of learning implementation, teachers present a story or apperception towards all students in the classroom by providing explanation and emphasis that there are some special need students in the class. Based on the interview performed with Rohana as the vice school principal who specially handles Special Need Children. She said that: "We remind and suggest the ordinary students that there are some Special Need Students. Students, A and B in our class are sick. Please help. Be thankful that we are not sick." Furthermore, Rohana also told the slow learners' background to their friends so they can help teachers and care of them during the teaching-learning activity. The following is the interview result about slow learners: "Yes students, when his mother was pregnant with baby, she suffered from typhus. Indirectly, the condition affected the infant. So, it's congenital. The healing process will take long time and process. So

please help me.” It is expected that after undergoing apperception activity performed by the teachers, normal children will understand and protect slow learners. So they understand slow learners’ behavior, study together and do not bully them. Even, cooperation between slow learners and peers exists. The Natural Science learning strategy which is utilized is the assistance of smart children and slow learners through peer tutor. Through the implementation of peer tutor learning strategy which is utilized by the teachers to teach Natural Science in the classroom, it will smoothen the learning and make it success. Learning strategy is a set of learning activities which are designed to achieve certain education objective (Setianingsum, 2019:91). Therefore, through learning strategy, all plans and activities to achieve learning objective, including the intermediary objective and learning activity which bring students to achieve their learning objectives (Dick & Carey’s, 1996). Besides, there is also continuous communication with parents concerning slow learners’ development. It was stated by Rohana that: “Alhamdulillah after implementing peer tutor and slow learners’ children assistance start from Grade I to VI. Yes, Alhamdulillah the success is obvious. Besides, it cannot be separated from the continuous communication with parents concerning the children’s development.” Story telling or apperception activity which is done by teachers are also confirmed by one of slow learners in Grade V. He stated that: “The teacher likes telling a story. My friends are also kind.” Besides, they are also happy in the class. It is also supported by the explanation of one of Grade V teacher, Dwi Rina Ismaniar who said that “One third students in Grade V are Special Need Children of slow learner type. They enjoy having peers, so they really care and assist them in learning activity.”



**Fig. 1.** The implementation of natural science in grade V.

how to do it. It is strengthened with observation result obtained from the observation which was done in Grade V during Natural Science learning in which the teachers have performed special assistance for slow learners as presented in Figure 2. If slow learners experience difficulty in learning, teachers give opportunity to ask. Dwi Rina said that: “If they find difficulty, I will give them chance to ask. If they don’t understand, I will explain it again. Sometimes they come to the front and ask for explanation, then I explain. The point is, if students find difficulty, we will guide, direct, and ask the material that has not been understood.”

It is in line with the observation done when slow learners misunderstand one of Natural Science lessons, teachers will come, explain, and guide.



In Natural Science learning, teachers also apply it in daily life and relate the material with another. Dwi Rina Ismaniar explained that the attribution of materials is usually performed by using integrated thematic approach. In Natural Science learning, Natural Science material is related to Indonesia material. She said:

“For example, the flowchart which is being made by them at present.” The teacher’s explanation is strengthened by direct interview with slow learners during the Natural Science lesson. She said that: “Natural Science material is confusing because it is difficult.” Furthermore, she showed flowchart related to compare human and cow digestion system. Teachers utilizes book and other learning source such as internet as the learning strategy variation. Meanwhile, it has not utilized audio visual technology because the school is under renovation so that the learning activity is only performed two lessons a day and has not been effective. In Natural Science implementation, teachers start the class by telling a story concerning the general students that they are in the same class as slow learners who need assistance and cooperation in the learning activity. Thus, it is expected that the class condition will be conducive and general students can help teachers and care of the slow learners during the learning. Teachers utilized peer tutor strategy in learning Natural Science. Peer Tutor is the assistance towards slow and general students. It means that smart general students will assist slow learners so that they can help the learning activity. It is a very important flexible grouping strategy. Students are expected to interact and work together when they develop knowledge on contents in Natural Science. Teachers who perform discussion of class introduction concerning contents ideas in Natural Science, followed by small groups or work peer. Students groups are trained for the inside by the teachers to complete the task given. Students’ grouping can be done irregularly. Based on the undergoing content, project, and evaluation, grouping and regrouping should be the dynamic process as one of differentiated instruction approach bases. The management of regular class inclusive setting should be beneficial both for students and teachers. Teachers should consider the organization and strategy in doing the learning so that the Natural Science learning can be effective to operate the class using differentiated instruction approach. Basically, not all students are same (Guild, P.B., and Garger, S., 1998). Therefore, the differentiated instruction approach application in the learning, especially Natural Science should be done, considering that students have many choices to find various information and understand the ideas which emerge from the learning process. Instruction differentiated approach requires more flexible teachers in adjusting the curriculum and information presentation towards what become the students’ need. In other words, teachers should not modify the students to adjust in the curriculum and learning, but the curriculum and learning. Therefore, differentiated instruction approach is a theory which is based on the premise that learning should be

adjusted related to students as individuals and be various in the classroom.

### c. Learning Evaluation

Based on Dwi Rina Ismaniar's explanation, natural science evaluation which is done by teachers is performed using authentic assessment by doing repetition/theme. Especially for slow learners, the assessment is added with assignments which help their understanding concerning the theme which is learnt. Usually teachers should repeat it with similar questions but special for slow learners, the numbers are reduce or the time is extended. Meanwhile, during the National Examination, the school report to Province Education Service.

## 4 CONCLUSION

Based on the research, differentiated instruction approach on Natural Science lesson for slow learners at inclusive primary schools which was performed at State 30 Primary School Palembang as the education role model of national inclusive education, it has been found that: 1) the assessment is performed independently and has not cooperated with local education service or psychological experts. It is found that the highest slow learners prevalence is 55.65%; 2) The curriculum utilizes the combination between classical KTSP and Curriculum 2013 which have not been modified based on the needs and diversity of the students; 4) The learning implementation uses peer tutor strategy using affective approach, dynamic grouping and intensive communication with parents concerning the slow learners' development through WhatsApp or meeting with the students' guardian, and 5) Learning Evaluation utilizes authentic evaluation and additional task as remedial substitute.

## ACKNOWLEDGMENT

The researchers would like to thank the Master Degree Program of Yogyakarta as the study university and PGMI Study Program of Tarbiyah and Teacher' Training Faculty of Islamic University Kalijaga Yogyakarta as the researchers' workplace.

## REFERENCES

- [1] Armiami, Yerizon, Reni Oktaviani Hersika. (2019). Trigonometry learning device based guided discovery for high school students of class X. *International Journal Of Scientific & Technology Research*, Vol. 8, Issue 08, 31.
- [2] Cole, C., & McLesky, J. (1997). Secondary inclusion programs for students with mild disabilities. *International Journal of Focus on Exceptional Children*, 29, 1–15.
- [3] Departemen Pendidikan Nasional. (2007). *Pedoman khusus penyelenggaraan pendidikan inklusif*. Jakarta: Depdiknas Dirjen Mandikdasmen Direktorat Pembinaan Sekolah Luar Biasa.
- [4] Dick and Carey's. (1996). *The Sistematic Design of Instruction*. Fourth Edition: Harper Collins College Publisher.
- [5] Fatimah, A.E. (2016). Peningkatan kemampuan pemecahan masalah matematis dan kemandirian belajar siswa SMK Negeri 1 Percut Sei Tuan melalui pendekatan differentiated instruction. *Journal of Mathematics Education and Science*, 2, 1, 14.
- [6] Guild, P.B., and Garger, S. (1998). *What is differentiated instruction? marching to different drummers* 2nd Ed. (ASCD, p.2) <http://www.ascd.org>
- [7] Hasyim, Yachya. (2013). *Pendidikan Inklusif di SMK*

- Negeri 2 Malang. *Jurnal Kebijakan dan Pengembangan Pendidikan*, Vol 1, 2, 112-121.
- [8] Iskandar, R. S. F. (2016). Penerapan pendekatan differentiated instruction untuk mengembangkan kemampuan pemecahan masalah matematis mahasiswa. <http://jurnal.nasional.ump.ac.id>
- [9] Loreman, Tim. (2005). *Inclusive School: a practical guide to supporting diversity in the classroom*. Singapore: South Wind Productions.
- [10] Loreman, Tim. (2007). Seven pillars of support for inclusive school: moving from "why?" to "how?". *International Journal of Whole Schooling*, 3, 2.
- [11] Pemerintah. (2009). *Peraturan Menteri Pendidikan Nasional Nomor 70, Tahun 2009, tentang Pendidikan Inklusif Bagi Peserta Didik yang Memiliki Kelainan dan Memiliki Potensi Kecerdasan dan/atau Bakat Istimewa*.
- [12] Palembang-pos. (2018). *Palembang Percontohan Sekolah Inklusif*. Palembang, Wednesday 31st October 2018.
- [13] Reddy, G. L., Lokanadha, R. Ramar, dan A. Kusuma. (2006). *Slow learners: their psychology and instruction*. New Delhi: Discovery Publishing House.
- [14] Setianingrum, N., dan Hidayat, N. (2019). The development of asset liquidity management learning based on online research and trade as a financial inclusion strategy for students. *International Journal Of Scientific & Technology Research*, Vol. 8, Issue 08, 91.
- [15] Tarnoto, N. (2016). Permasalahan-permasalahan yang dihadapi sekolah penyelenggara pendidikan inklusi pada tingkat SD. *Jurnal Psikologi Indonesia*, 13, 50-61.
- [16] Valeo, A. (2008). Inclusive educations support systems: teacher and administrator views. *International Journal of Special Education*, 23, 2.
- [17] Villanueva, M.G., Taylor, J., Therrien, W., and Hand B. (2012). Science education for students with special needs. *International Journal of Studies in Science Education*, 48, 187–215.