USING ENGLISH IN SCIENCE CLASS AS AN ATTEMPT TO MAXIMIZING INPUT IN SECOND LANGUAGE LEARNING

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Abstract

To face the challenges in Millenium 21, the government of Indonesia is inevitably required to prepare Indonesian young generation so far in advance that they will become individuals who have competitive advantages in the globalized era. One of the ways to equip them is through education. This has been reliazed by Universitas Negeri Malang through its several laboratory schools. One unique feature of the university-based lab primary school is that the curriculum developed reflects the result of a synergy between the National Curriculum of Indonesia and International Framework, in which English is as the medium of instruction in two school subjects, Science and Mathematics. The present study is conducted as an attempt to examine the process of teaching and learning of Science and its impact on acquiring a second language.Therefore, the design of the study adopted is descriptive quantitative which attempts to describe theprocess of acquiring Englishthrough Science (Gay, 1987:189).The subjects involved were the third graders with English as the medium of instruction in the Science class.Based on the the results of analysis of the data obtained, it was found out that (1) the teachers of the observed classes implemented some principles underlying CLIL practices, especially in exposing learners to the subject specific vocabularies and facilitating their productive skills through writing and speaking activities even though they rarely highlighted the grammatical pattern during the teaching and learning Science; and (2) the students' language comprehension was in fact greater than their language production. All in all, it is concluded that teaching Science in English facilitates the learners' proficiency in learning English.

Key words: English, Science Class, Second Language Learning

Rationale

To face the challenges in Millenium 21,the government of Indonesia is inevitably required to prepare Indonesian human resources so far in advance that they will become individuals who have competitive advantages in the globalized world. One of the efforts to realize the preparation is by providing well set-up program of eduation. This has been reliazed by Universitas Negeri Malang through its several lab schools (Kindergarten, Primary School, Junior and Senior High Schools, and School for the Autistic) which are located in two cities, Malang and Blitar, both in East Java Province, Indonesia, having been implementing content subjects in English as a medium of instruction since 2006 (Lab School Guideline, 2011).

In the case of the laboratory schools of Universitas Negeri Malang, they have some specialties. They are, first of all, in the form of a synergized curriculum in that the schools, particularly the Primary Schools, use a synergy of the National Curriculum of Indonesia and the International Framework. Secondly, the learners are taught through English as the medium of instruction in the school subjects, Science and Mathematics since they sit in the first grade. Another specific feature is that the materials used are the teacher's own product. Finally, the lower classes (1st-3rd grades) are taught in full English in the so-called

‘International Class Program’ (ICP in short), while the upper classes (4th-6th grades) are taught in bilingual system, i.e. in Indonesian and English. This is intended to prepare the learners for the national as well as the international examinations. As a consequence, the school also issues double certificates for the learners: one for the School-Based Examination and/or the National Examination, and the other for International standard framework tests. In the long run, it is expected that the graduates of this Primary School will be well-equipped to face the challenges of AFTA and MDG when the time comes for them (EHE, 2011).

To respond the above challenges, the ICP has its own framework in which two subject matters – Science and Math are taught in full English and the subject of English is more enriched by English literature in simplified versions. As stated by Coyle et al. (2010), the forces of global change with the development of technology present challenges for education since young people nowadays growing up with technology are inclined to developing a mind set to which educators need to respond. Educational practice always requires adapting to the cultural demands of those involved – learners, teachers, and communities. Integration is now a key concept in modern era and can be accommodated within the CLIL educational approach. Therefore, young generation should be equipped with competences to live in the global era.

CLIL classroom practices have long been attracted researchers’ interests. Infante, Benvenuto, and Lastrucci (2008) conducted an ongoing experimental study on integration between content and language at Primary School in Italy. The project involves seven experimental classes and the other seven controlled classes in the Lombardy region, Northern Italy, for two consecutive years (4th and 5th grade). The participant teachers are monitored through face to face meetings, an e-learning platform and a journal which is kept throughout the process. In a way more specific, Yassin, Marsh, Tek, and Ying (2010) scrutinized the learners’ perceptions towards the teaching of science through English in Malaysia by employing a questionnaire, PATSIE (Perceptions and Attitudes towards the Teaching of Science in English). Their work thoroughly compared Limited English Proficient (LEP) and non-LEP (NLEP) learners’ perceptions towards the teaching of Science through English.The results indicated that NLEP learners have more positive attitudes towards Science in English, greater parental support, and experience of using the English language than LEP learners. Another close look at CLIL practices has also seen by Yassin, Tek, Alimon, Baharom, and Ying (2010) who studied the teaching of Science through English with a focus on teachers. Nine Year 4 science lessons were observed, videotaped, transcribed and analyzed for instructional opportunities that teachers offer to engage pupils in the different levels of cognitive processes and knowledge dimensions of Bloom’s Revised Taxonomy. The findings indicated that questions posed by the teachers were substantially (98.8%) coded at the lower cognitive taxonomic categories (i.e., remember and understand) suggesting that learners were engaged at a lower cognitive levels in the teaching of science through English.

The present study is conducted as an attempt to examine the process of teaching and learning of Science through English and its impact of acquiring a second language, particularly in the third graders with the English as the medium of instruction in Indonesia. To be able to provide a thorough explanation of the aforementioned focus, some underlying theoretical insights on the basic concept of SLA and its relation to CLIL practices, and a brief description of Primary Laboratory School of Universitas Negeri Malang would be briefly discussed below.

The Interconnection between SLA concept and CLIL Practices

Any discussion on the nature of second language acquisition has resulted argumentations and hypotheses. Meisel (2006), for example, convincingly argues that when a second language is exposed too early, it will have a negative impact toward not only the language development, but also children psychological, cognitive, emotional, and moral behavior. On the other hand, Bournot-Trites and Tallowitz (2002) specifically elaborate Swain and Lapkin (1982), Marsh et al (2000), and Bournot-Trites and Reeder (2001) observations on the influence of second language acquisition toward other competence out of language domain. Swain and Lapkin (1982) gave a standardized Math test to some bilingual children who are in an immersion program and to some monolingual children. The results show that there is no difference between the two groups which means that the second language does not negatively influence the children ability in understanding the school subject. Furthermore, Bournot-Trites and Reeder (2001) who have also conducted a Math test to some bilingual children sitting in a *French Total Immersion Program* declare that they demonstrated better results compared to the monolinguals.

Apart from the various hypotheses mentioned above, basically the second language acquisition might possibly develop either slower or faster depending on the level of readiness of the children. However, the more obvious point is that the improvement of the language comes from supplying communicative and comprehensible input, and not from forcing and correcting production (Krashen, 1981). In addition, the finding of Newport *et.al.*, (1977) suggests the generalization concerning the relationship of input and the child's developing grammar. Children progressively and linguistically grow by understanding language that is a little beyond them. That is, if a child is at stage *i*, she/he can progress to stage $i + 1$ along the "natural sequence". The child understands language containing structure that is a bit beyond him or her with the aid of context. However, parents, caretakers, or teachers as the source of language input tend to modify their speech in order to communicate with children, to control their behavior, and to make them understand what they are saying in which then much *interlanguage* talk input might be too simple and may not contain $i + 1$ for the more advanced acquirer (Krashen, 1981). This condition often influences children or learners' ability to demonstrate their true competence in other subjects used English since they lack the necessary of language skills to understand the lessons or produce written or oral work. How quickly learners progress through the stages in learning second language namely: Preproduction, Early Production, Speech Emergence, Intermediate Fluency, and Advanced Fluency, depends on many factors, including level of formal education and family background (Krashen& Terrell, 1983).

In the context of second language learning, there have been increasing interests that seek for a close connection between learning (and teaching) language and learning (and teaching) contents. Hypothesizes following some classroom experiments have also been made to proof whether or not learning and teaching content in the additional language can help learners improve their language skills at the same time. The idea of integrating content and language develops gradually as a piece of science in the area of education that is then so-called *Content and Language Integrated Learning* (CLIL). Coyle, Hood, & Marsh (2010) mention that CLIL is a dual-focused educational approach in which the teaching and learning process focuses not only on the content or subject and not only on language because the targeted outcome is on both the content and language. In a way more specific, Dale and Tanner (2012) argue that CLIL is a way of teaching where subject content – for example, history, science, or physical education – is taught in another language (often English). The idea of interweaving language in any subjects as well as interweaving subjects in language class becomes the core idea of CLIL. However, it is not about translating first-language

teaching and learning into another language in the hope that learners will be immersed, but using language along with learning language as having been highlighted by Coyle et al. (2010).

In this point, what is significant is the data mentioning that 80% of the member states of the European Union are now implementing CLIL based class in their education system (Eurydice in Dale and Tanner, 2012). It convincingly proofs that CLIL has brought some benefits, that is that learners become more motivated, their brains work harder so that their cognition develop well, the communication skill and language progress more because of receiving a lot of input, they can interact meaningfully through speaking and writing practices, they develop intercultural awareness by learning in different ways, and they are more prepared for studying another language. For teachers, CLIL encourages innovation, renewal and reflection, helps improve enthusiasm and motivation to non-language teachers to attend language courses, and develops collaborative working between subject and language teachers. Beyond the aforementioned benefits, CLIL practices lay mainly on these six basic characteristics; (1) activating knowledge, (2) guiding understanding, (3) focusing on language, (4) focusing in speaking, (5) focusing in writing, and (6) assessing.

A Brief Description of Primary Laboratory School of Universitas Negeri Malang

The university laboratory schools have been founded in 1984 under the management and funding of a private educational foundation; however, since July 2009 the lab schools have been affiliated into the management of the university. This implies that the schools have adopted the university's more accountable and transparent managerial systems. In operation, the schools are under the management and responsibility of a board the so-called 'Institute for Developing Laboratory of Education' (Institute for Developing Laboratory of Education Document, 2010). The institute has then set up the ultimate outcome of the lab school graduate which is in compliance with the university's vision and mission that in the academic area, the graduates are expected to become independently competent in science, technology, and arts as well as strong in character. The previously mentioned goals are aligned with national and international standards. Moreover, because the schools are university-based, the teaching and learning process is also study-based, making them different from other private and public schoolsin the region. Various diverse pedagogical practices such as natural acceleration system of learning, mastery learning, team teaching and modular instruction are put into practice as learners' active learning becomes integrated with the university's larger studyagenda.

For the purpose of the study, the primary school was the focus of investigation as the school has something in specific. In 1970, the primary school was designated as an accelerated five-year school, allowing learners to graduate a year early. At present, the school has two programs: the regular program and the international class program (ICP). The first version adopts the national framework, and the other follows a blended framework – the national plus adapted international content in which English is the predominant medium of instruction, particularly for Science and Mathematics (Math). Therefore, the instructional materials of Science and Mathematics (Math) are the final product of synergy of the national and international framework. Table 1 displays the content of Science framework as the result of blending the two frameworks and this is the scope of the present study.

Table 1. Blended Content for Science Framework

Science-based Topics	Competences
Biology	Recognizing human senses and their functions Recognizing plants with their roots, leaves, stems, and flowers Recognizing the process of taking up water from roots to stems Recognizing the growth of plants in connection to temperature Exploring various healthy foods for healthy life Exploring physical activities which are good for health
Physics	Observing moving objects depending on the shape and size Exploring how force can change the shape of objects Exploring how force makes objects move and stop Exploring how force can make objects move fast, slowly or change direction.
Chemistry	Recognizing objects with magnet and with no magnet Recognizingthe nature of things (solid, soft, shining) Selecting things based on the nature for particular purposes

The blended content for Science framework depicted in Table 1 above reflects the synergized content of the national as well as the international frameworks implemented in the primary school. Therefore, the content of Science framework was then the basis of developing the test items which contained linguistic elements related to Science. In fact, Science for the primary school learners are integrated taught implying that Biology, Physics and Chemistry are not learned as individual subject.

Prior to the present study, another study was conducted to examine the efforts of the university-based primary laboratory schools to prepare the learners facing the Economic Community of South Asian Countries. Based on the study conducted by Rachmajanti and Anugerahwati (2014) at the Universitas Negeri Malang Primary Schools involving 90 learners from the primary schools – Grades 1-6, it was evident that (1) 66.2% learners stated that the materials from modules were interesting to be learned; and (2) related to the assessment for English, Math and Science, 78.4 % learners admitted that they often obtained good score in English since they thought that English was easier than other subjects, 56.8 % learners also admitted that sometimes they got satisfactory scores in Math, and 60.8 % learners stated that they often reached good scores in Science. This present study, however, provides more focus on the process of teaching and learning Science through English in order to examine how much English (receptively and productively) they learn through a content subject. In order to discover the amount of learning English through CLIL program, the following design is adopted.

Method

The design of the study adopted is descriptive quantitative which attempts to describe the process of acquiring English through Science (Gay et al., 2010).The subjects of the study involved are 2 (two) teachers and 39 third graders of Primary Laboratory School of Universitas Negeri Malang, East Java, Indonesia in the second semester of the academic year 2014-2015. The learners belong to the so-called ‘International Class Program’ (ICP) in which English is used as the medium of instruction for other subjects—Mathematics and Science.Yet, for this study, the focus is on the teaching of Science in English as the learners as a matter of fact always accomplish the scale of 5 in the international-based test on Science.

Since the ICP consists of 2 (two) parallel classes, one was treated as the subjects of the try-out around 19learners and the other for the real study was 20. They have learned Science for three years beginning at Grade 1, consuming 2 times 40 minutes twice a week. Hence, since the moment the learners were involved in the study, they have acquired the content of Science in English for almost 3 (three) years.

To obtain data to respond to the study questions, several instruments were made use; such as documents on the school guideline, the framework of Science, a questionnaire and an interview guide for the teachers, classroom observation sheets, and 15 test items on Science which incorporate Biology, Physics, Chemistry, and Scientific Inquiry. Each of them was analyzed accordingly that is all written documents were elaborated descriptively, and the test on Science was scored and then the linguistic elements in the test were analyzed to examine the learners' English language comprehension and production, whereas, the results of analysis of the interview and questionnaire outlining 36 (thirty six) questions on 6 basic elements; (1) Activatingprior knowledge, (2) Guiding understanding, (3) Focus on language, (4) Focus on speaking, (5) Focus on writing, (6) Assessment, review, and feedback were analytically presented. The data collection was conducted at the school for 2 (two) months.

Findings and Discussion

This section discusses and elaborates the results of the teaching and learning process in Science classes and the analysis of language comprehension and production during the learning process.

A. The Process of Teaching and Learning of Science in English

The teaching and learning process in Science classes was carefully observed mainly on the basis of CLIL characteristics which would be put together with the results of questionnaire and interviews. In general, the Science classes are conducted in the three main stages: introduction, main activities, and closing. In the introduction stage, the teachers activated the learners' prior knowledge, in the main activities, they guided the learners' understanding, and in the closing, they assessed the learners' competences. This very general instructional framework should, in a way more precise, comprise some other specific features of CLIL, they are; *focus on language components*, *focus on speaking*, and *focus on writing.* Other than those strongly highlight the elaboration between the content subject and language.

1) Activating prior knowledge

This element mainly consists of 6 questions elaborating how the teachers activated and prepared the learners at the beginning of the class by employing a variety of media such as visuals and graphic organizers. As observed from the Science classes, the teachers have demonstrated some efforts to stimulate and activate prior knowledge of their learners by mainly taking the learners' characteristics into account. IIIA learners are more active orally compared to IIIB; consequently the teachers of both classes treat them pretty much differently. More clearly, the result of the questionnaire shows that the teachers of Science both in class IIIA and IIIB **often** identify what language related to the topic especially the range of vocabulary the learners need to learn. In addition to the preparation, the teachers also **often** use graphic organizers, such as mind maps, tables, charts, and diagrams to help the learners organize what they know about the topic.

2) Guiding understanding

In the sub section of *guiding understanding*, the questionnaire contains 6 questions outlining kinds of input, kinds of questions related to LOTS (lower-order thinking skills) and HOTS (higher-order thinking skills), classroom interaction, graphic organizers as media,

strategies and learning activities, and teacher attachment to their learners. Again, the different characteristics of the learners play a role in the way the teachers treat them. It is more explicitly articulated in the result of questionnaire that the different learning treatment is given to IIIA and IIIB when the teachers come to the use of LOTS and HOTS since learners in both classes have different characteristics. The learners of IIIA are much more active compared to IIIB, so that the variety of stimulating questions given is different. In the case of giving language inputs, both teacher of IIIA and IIIB **sometimes** use multimodal inputs and graphic organizers by relying on the characteristics of materials.

3) Focus on language

This part focuses on the use of different activities to help learners recycle vocabularies, the use of personal vocabulary and subject-specific terminology, the teachers help learners notice how language is used in the subject by reviewing grammar and vocabulary for example, the teachers help learners notice the basic differences between English and their first language. Interestingly, the finding shows that the teachers of both IIIA and IIIB just **occasionally** discuss the components of language in the Science class. It means that they focus more on the content, instead of balancing between content and language. Thus, it arguably influences the improvement of learners' language. It is in line with the result of classroom observation that both teachers do not really put much concern on discussing language components while teaching subject. The other interesting finding is that the teachers in both IIIA and IIIB **never** help learners notice the similarities and differences between English and *Bahasa Indonesia* as the learners' first language. However, they **occasionally** use a variety of vocabularies and **always** use subject-specific terminology during the class.

4) Focus on speaking

Focus on speaking section aims at addressing some issues; the encouragement of spoken output, the use of speaking frames or graphic organizers, the use of various repertoires, the involvement of both formal and informal speaking situation with different audiences, and the use of information gaps in speaking activities. As carefully seen from classroom practices, the two-way-verbal communication between teachers and learners were dynamically developing. It is convincingly confirmed by the result of questionnaire that the teachers of Science in both IIIA and IIIB **often** encourage learners to speak by designing activities gearing to the chance to argue on something, give opinion, ask questions, and respond to stimulus. However, the teachers **sometimes** apply the strategy of information gaps in the class.

5) Focus on writing

Focus on writing section tries to figure out to what extent teachers encourage written output from learners, expose different text types to learners, use writing frames or graphic organizers such as tables, diagrams, and model texts, help learners with different stages in writing such as brainstorming, organizing ideas, drafting, and editing, and help learners move from concrete to abstract language in their writing. The result of observation and interview reveals a significant finding that both Science teachers in IIIA and IIIB have long implemented particular strategy to improve learners' ability in writing; that is journal writing. It is a regular activity in which learners have to write short and simple analytical paragraph on the topic being discussed that day. More clearly, something really matters seen from the result of questionnaire is that the teachers of Science in both classes **always** encourage their learners to produce written product which is mostly about problem-solving in Science. In this way, the teachers can also introduce learners to different text types as well as help them maintain and enrich their vocabularies and subject-specific terminologies.

6) Assessment, review, and feedback

The last part of the questionnaire concerns on how CLIL teachers employ different variety of assessment techniques, encourage learners to do peer review and feedback, give feedback on learners' language, give marks on both the content and the language, provide clear assessment criteria and marking system, and design a rubric. The finding is significant in the case how the principles of CLIL are implemented that is the teachers of Science in both IIIA and IIIB **always** give feedback on the language of their learners especially on the errors the learners make, mark the content and the language particularly on their writing product by which the teachers highlight the significant grammatical errors, and design clear assessment criteria to finally be used as marking and grading the learners.

B. The Results of Analysis of Language Comprehension and Production in Science Classes

As previously mentioned, the subjects, both in the tryout and the real study, belong to different classes; Class IIIA and Class IIIB respectively, each of which is categorized into 3 (three) levels of competences – high achievers, mid achievers, and low achievers. The findings of the results of analysis of achievement on Science of each category are displayed and elaborated underneath.

In the Course of the Tryout

Of the nineteen subjects ranging between the obtained scores 92 and 51, the subjects of Class IIIA were classified into 3 (three) groups namely high achievers (92 up to 79), mid achievers (78 up to 66), and low achievers (65 up to 51). After being tried out, the test on Science underwent some changes like 1) the number of questions were reduced and reoredered in terms of difficulty levels and, 2) a few instructions were simplified. In the course of the tryout the findings are described in terms of language comprehension and language production.

In terms of language comprehension, it was discovered that 1) the high achievers (9 learners/ 47%) comprehended **all** the meaning of technical terms related to words and phrases on Science, kinds of sentences like declarative statements, instructions, and questions, 2) the mid achievers (6 learners/ 32%) understood **most** of the meaning of technical terms related to words and phrases on Science, kinds of sentences like declarative statements, instructions, and questions, and 3) the lowachievers (4 learners/ 21%) understood **a few** of the meaning of technical terms related to words and phrases on Science, kinds of sentences like declarative statements, instructions, and questions.

On the other hands, in terms of language production, it was discovered that 1) the high achievers were competent to write correct words such as *root, stem, James, leaves, walk, run, jump, hand, eat, touch, writing, sun light, float, carbohydrate, strecthy, shiny, roller skates, soft, food, fertilizer, chocolate;* correct phrases like *water and sunshine, same amount of water and same amount of fertilizer*, clauses such as *because the plant gived water*, *because it is good for our health;* complete simple sentences like *it will go up again, the ping pong ball will float,* 2) the mid achievers can write such words as *root, 'steam'* for stem, *strecthy, shiny, chocolate;* some phrases like *swimming and running, , hand for touch the thing, ride bicylce,* and such clauses as *because for balance* (for balanced) *diet, ,eat and grab something;* complete simple sentences like *No, it can't, Yes, it can, He give water every day, He give water every day*, and 3) the low achievers are able to write correct words such as *Root, water, yes, no , Writing, eat , walking*; some phrases like *put eraser,*

walk and run; such clauses as Because he plant water every day, complete simple sentences like No, it can't, It will go up again.

Next is the elaboration of the results of analysis of language comprehension and language production of the subjects in Class IIIB.

In the Course of the Real Study

Of the twenty one subjects ranging between the obtained scores 95 and 50, the subjects of Class IIIA were classified into 3 (three) groups namely high achievers (95 up to 81), mid achievers (80 up to 66), and low achievers (65 up to 50). Similarly, the language comprehension and production of the subjects of the real study are demonstrated below.

In terms of language comprehension it was determined that 1) the high achievers (11 learners/52%) comprehended **most** the meaning of technical terms related to words and phrases on Science, kinds of sentences like declarative statements, instructions, and questions, 2) the mid achievers (7 learners/ 33%) understood **some** of the meaning of technical terms related to words and phrases on Science, kinds of sentences like declarative statements, instructions, and questions, and 3) the lowachievers (3 learners/ 14%) understood **a few** of the meaning of technical terms related to words and phrases on Science, kinds of sentences like declarative statements, instructions, and questions.

In contrast, in terms of language production, 1) the high achievers were competent to write correct words such as root, stem, James, leaves, jump, hand, eat, , float, carbohydrate, strecthy, shiny, jogging, food, fertilizer, chocolate, rough; correct phrases like fatty foods, ,clauses such as because the plant gived water; complete simple sentences like it will go up again, the ping pong ball will float, 2) the mid achievers can write such words as root, 'steam' for stem, strecthy, shiny, chocolate; some phrases like swimming and running, , and such clauses as for our healthy (health); complete simple sentences like No, it can't, Yes, it can, He give water every day, He give water every day, and 3) the low achievers are able to write correct words such as Root, water, yes, no , Writing, eat , walking; some phrases like put eraser, walk and run; such clauses as Because he water water every day, complete simple sentences like the ball will go under the water and go up again.

Based on the results of the findings, we can put forward some points that firstly, the learners of three levels of proficiency generally comprehend words, phrases, imperatives, declarative and interrogative statements on Science which are reflected in the way they gave responses. Whenever they understood the text, they provided the correct responses based on what they learned. However, for the non high achievers, it is presumed that if they did not understand the linguistic items and their meaning, or they lacked the content, they would not respond correctly. For instance, "Why is it important to eat different kinds of foods? Fish and ches" (It should be "To keep healthy"). Hence, it is evident that the high achievers are more competent than the others in internalizing language – the low and mid achievers. This evidence is supported by what Wagner-Gough and Hatch (1975) theories which postulate that the second language acquisition occurs due to some factors in which one of them is the input difference. Children tend to repeat, write, or speak the language input they learned when facing limited knowledge toward the question used vocabulary that they haven't learned. Secondly, in the process of learning the content-based language particularly in producing the language, it reveals that the learners in all levels undergo what Krashen (1981) called 'interlanguage' in that they have their own linguistic patterns to express their ideas which do not follow the English grammatical rules, spelling, or choice of words. As an example,

instead of writing "because James waters the plant every day", it was written "because James water the plant every day". The use of "-s" for the first person singular was ignored. Thirdly, the learners have learned English through the teaching and learning process of Science which is beneficial according to Dale, L. and Tanner, R. (2012) that language can be learned through content or the so-called the CLIL approach. Forth, language comprehension comes prior to language production as what is stated by Krashen (1981) that learners should be exposed a lot to language input before they are able to use the language.

Conclusions and Suggestions

In conclusion, the teaching and learning processes of Science in Primary Laboratory School of Universitas Negeri Malang, Indonesia are conducted in English as the instructional language. The teachers in both IIIA and IIIB acted as the subjects of this study have adopted some pieces of CLIL principle aspects, such as imposing subject-specific terminology in building learners' vocabulary during the stage of activating learners' prior knowledge and guiding learners' understanding, designing regular writing activities, and enforcing verbal communication in the classroom in the purpose of improving learners' automaticity in speaking. The English- based Science instruction provided positive impact on the learners' language comprehension and language production for all the three achievers (hig-med-low) Except that the high achievers (52%) are more competence than the other two. However, the teachers do not intentionally focus on grammar. Then, it is reasonable to assume that this lack of teacher attention might cause some errors in the learners' language production discussed previously. On the other words, teachers do not purposely provide spaces to explain grammar in the Science class, so learners do not really notice the structural differences between English and their first language.

Based on the results of this study, it is suggested that the teachers of Primary Laboratory School of UM, firstly, make use of the mapping of language comprehension and production of their learners as their input to provide more intentional practices on the application of the linguistic features mostly troublesome for them by constructing HOTS-based questions for Science, and secondly, to realize this action, all Science teachers should improve their communicative competences so as to assist their learners. For the school itself, it is recommended to conduct regular supervision, monitoring, and evaluation for instructional process so that the school can identify what is required by the teachers to promote their awareness that content and language are both prominent particularly for starters. This can be accomplished, for instance, through the provision of workshops.

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