

Teachers Pedagogical and Professional Competences in CLIL-Based Primary Schools in Indonesian Context

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Abstract: To face the Millennium Development Goals, schools are supposed to equip the students to have proper English skills to help them interact in AEC. Yet, empirical evidence revealed that the education in Indonesia ranks 64 out of 120 countries (EDI, 2012). For this, Universitas Negeri Malang as one of the teacher training institutions in Indonesia takes the responsibility in improving the teachers' quality. Hence, this research investigated the teachers' pedagogical and professional competences in teaching English, Math, and Science. Questionnaire, interview guide, observation sheets, and set of tests were used in descriptive quantitative method. Results showed that pedagogically, most of the teachers lack the competences in translating framework into materials, designing classroom activities, and facilitating students to develop their potentials. While in professional competence, most of the teachers find difficulties in developing and delivering materials creatively in proper English. Periodical trainings and workshops are proposed as the remedy. Nowadays, English is taught in all parts of the world, as far reaching as the remote areas in small countries. Indonesia is no exception; English has been introduced and taught in schools, starting from primary to upper secondary, in all its 34 provinces. In secondary schools English is a compulsory subject, while in primary schools, it is offered as a local content. The decision for this was provided by the Ministry of Education and Culture, through the Decree Number 060 Year 1993, which states that English may be taught in primary schools, starting from Grade 4. This law was strengthened with the Decree of Ministry of Education and Culture Number 20 Year 2003 on the System of National Education. It was then accepted enthusiastically, and primary schools began to teach their students English.

Keyword: Pedagogical, Professional, Competences

As a local content subject, English is given as a "language across curriculum" in some schools, or, as it is now termed, in a Content and Language Integrated Learning (CLIL) mode. Subjects such as Mathematics and Science are taught using English as a Medium of Instruction (EMI). This policy also applies to schools which adopt the international curriculum, and thus develop a synergy between the National Curriculum of Indonesia and an International Curriculum from one of the OECD countries. These schools have a separate type of class which is called the International Class Program (ICP) where the bilingual education program is adopted (Rachmajanti et al., 2015).

This policy, consequently, demands that teachers are able to teach the subjects of Mathematics and Science using English. Those abilities are part of the requirements which are included in the four competences that teachers have to possess (Decree of Ministry of Education and Culture number 14, year 2005). They have to master the contents of their subject matters (professionally) as well as the techniques of teaching them (pedagogically). This becomes a crucial matter in primary schools, where the curriculum used is thematic, particularly in schools which employ two curricula as stated above; teachers have to be able to combine the themes of the national curriculum with those in the international one. In addition, they also have to be able to teach the content-based subjects in English.

In light of that issue, schools then turn to CLIL as the solution for teachers teaching in schools which integrate two curricula. As stated in the paper of European Language Policy and CLIL (2003), “within CLIL, language is used as a medium for learning content, and the content is used in turn as a resource for learning languages”.

As Wolff (2007) in his article *Some Educational and Methodological Principles of Content and Language Integrated Learning (CLIL)* mentions,

“in terms of teaching methodology, the way in which one can integrate subject and language work is of central importance for every form of CLIL. As in any form of institutionalised learning, however, the question also arises for CLIL as to how the learning processes in school can be appropriately promoted methodologically and didactically. This crucial didactic question raises itself doubly in the context of CLIL since the aim is to promote knowledge of a subject and knowledge of a foreign language at the same time”.

In addition to the discussion above, another source, Cambridge (2016) mentions that one fundamental thing in designing school curriculum is developing teachers' competence in delivering the contents of their subject matter through the medium of English.

The researchers have been actively involved in the supervision and training of teachers in the laboratory schools under *Universitas Negeri Malang* (State University of Malang) but so far there has not been any study which investigates the competences of the teachers. From the visits and observations to the schools, it was discovered that most of the students in those schools had good grades in their exams on the three subjects: Science, Mathematics, and English. Most of the students achieved the band of 3 or 4, where 6 is the highest band and 0 the lowest.

The researchers then got curious; what enabled the students to reach the good scores? Was it the teachers? This paper, then, is intended to find out whether or not teachers teaching the content-based subjects (Mathematics, Science and English) are competent. Henceforth, the research problems are stated as follows:

1. How is the professional competence of the teachers in teaching English, Mathematics, and Science in CLIL-Based Instruction?
2. How is the pedagogical competence of the teachers in teaching English, Mathematics, and Science in CLIL-Based Instruction?

THEORETICAL INSIGHTS

The education goal of Indonesian government is to ensure the availability of competent and professional educators through the Regulation for teacher and lecturer No. 14, 2005 which states that teachers are professional educators with the primary task of educating, teaching, guiding, directing, train, assess and evaluate students. Furthermore, article 8 stated that teachers are required to have academic qualifications, competence, certification, education, healthy spiritual body, as well as having the ability to achieve national education goals. As been generally agreed that the output of education should aim at student improvement on achievement that should begin with the teachers' competence in improving student performance (Armour-Thomas, et al. 1989; Ferguson, 1991).

Professional and Pedagogical Competence in Indonesia

Every professional teacher in Indonesia is required to have certain standards of competencies. A professional standard attempts to describe the teachers' belief, knowledge, understanding and ability as specialist practitioners in their fields (Ingvarson, 1998). Some

proposals discussed the educators' standards as means for teacher knowledge and profession of teachers in accordance with quality control and effective professional learning (Darling-Hammond, 2000; Kleinhenz & Ingvarson, 2007). Houston & Howsam (1972) defines competence as adequacy for a task or as possession of required knowledge, skills, and abilities. Meanwhile in the perspective of national education, the government has formulated four types of teacher competence as specified in Law of the Republic of Indonesia Number 14 Year 2005 on Teachers and lecturers, which are pedagogical, personal, social, and professional competences which are obtained through professional education.

Generally speaking, pedagogical competence is the ability to understand the learners, to design curriculum or syllabus, and to actualize the learners into their various potentials. Pedagogical competence can be described as the ability and the will to regularly apply the attitude, knowledge and skills that promote the learning from definite goals and frameworks through continuous development of teaching in the best way. This should be in line with the goals and the existing framework and presupposes continuous development of the teacher's own competence and course design (Ryegard, 2010). It has close connection with three important factors of education, namely educational achievement, professional development and societal change (Suciu & Mata, 2011). While in the National Education standards, the explanation of article 28 verse 3 points out that a pedagogical competence is the ability to manage the learning of students includes an understanding of the learners, the designing and implementation of learning, evaluation results learning, and the development of learners to actualize various potentials. According to Arikunto (1993), professional competence requires teachers to have a broad knowledge and depth of understanding of the subject of teaching and will be taught, as well as mastery of methodology in the sense of having theoretical concepts, ability to choose the right method, and can use them in the learning process. The professional competences mentioned in the Decree of Ministry of Education and Culture of Indonesia No.16, 2007 cover: 1) the mastery of materials, structure, concept and mind set of scientific support of teaching subjects, 2) the mastery of basic standards of competence and the competence of the subjects/ fields of the development of teaching, 3) the ability of developing learning materials, 4) the ability of developing professionalism in a sustainable manner by taking reflective action, and 5) the utilization of information and communication technologies to communicate and develop themselves.

Insights into relevant features of teacher competences can be found in international studies, projects which concerned on teacher education, cognition and teacher effectiveness (Kelly & Grenfell, 2004; González & Wagenaar, 2005; Rachmanjanti, et al, 2015).

CLIL AS THE FOCUS OF THIS STUDY

Teachers' competences are highly demanded in the so-called "CLIL-based Classroom" in which teachers are not only required to be competent in the subject matters but also the linguistic competences. In order to adopt a CLIL approach, in which language and content are integrated, certain pedagogical principles must be address (Coyle, et. al., 2010).

Proficiency in the content should be in harmony with the language proficiency as stated by Coyle, et. al. (2010) and Dale, et. al. (2012) and. Four key principles are vital in CLIL context popularly known as 4Cs: cognition, content, communication and culture. Cognition refers to the teacher's knowledge base. Content, as the term suggests, is about the teacher's ability and mastery in his/her subject matter. Communication is the ability of the teacher in delivering her/his lesson using good communication skills, whereas culture touches upon the norms, values, and beliefs of the target language, in this case English.

CLIL settings is necessary for learners to improve their knowledge both their content learning and their language learning and using. Hence, using the language to learn has equal importance as learning to use the language (Coyle, et. al., 2010). As this study focuses on the examination of teachers' pedagogical and professional competences in CLIL context, the focus of the 4Cs will be on *cognition*, *content*, and *communication*. In other words, the researchers want to find out how well the subjects master their pedagogical competence in planning, implementing, and evaluating their teaching using English, and also how well they master the professional competence, i.e. their mastery of the subject matter they teach as well as the use of English as the medium of instruction.

METHOD

The design of the study adopted is descriptive quantitative which attempts to describe the teachers' pedagogical and professional competences in the process of teaching and learning English through contents (Gay et al., 2010). The subjects of the study involved were 6 (six) teachers (3 teachers for each subject matter) and 120 students of Grades five and six, 60 for each, in the first semester of the academic year 2014-2015 who had achieved nearly the maximum scores (band 6 of international grading) in English, Math, and Science from 2 (two) private primary schools in East Java, Indonesia. Both the teachers and the learners belong to the so-called 'International Class Program' (ICP) classes in which English is also used as the medium of instruction for other subjects—Mathematics and Science. The students had relatively learned English for three years beginning at Grade 1, consuming 2 times 40 minutes twice a week. Hence, they had acquired the content of those three subjects for at least 3 (three) years. Thus, for this study, the focus is on the teaching of English, Math, and Science since the three previously mentioned subjects are always delivered and internationally examined in English.

To obtain data to respond to the study questions, several instruments were made use; such as documents on the teachers' biodata (including the evaluation sheet of teacher's English proficiency) and the school guideline (syllabi, lesson plans, worksheets), questionnaires for the teachers and the students, a structured interview guide for the ICP coordinator, classroom observation sheets for the instructional process, and a set of test items for the English, Science and Math for the teachers. Each of them was featured by its specific variables and descriptors. For the questionnaire for teachers, it is composed of 5 (five) variables: 1) the use of English as a medium of instruction for three subjects (greetings, giving instructions, delivering materials, explaining new concepts, reviewing concepts, using media, giving feedback, questioning and answering, responding, giving assignments, doing reflection, making conclusions, leave-takings, 2). frequency of using English in every meeting and Cambridge class, 3) language proficiency, 4) problems in using English, and e) efforts to improve English.

Whereas, for the questionnaire for the students, there are 3 (three) variables: 1). the use of English as a medium of instruction for three subjects (greetings, giving instructions, delivering materials, explaining new concepts, reviewing concepts, using media, giving feedback, questioning and answering, responding, giving assignments, doing reflection, making conclusions, leave-takings. 2). frequency of using English in every meeting and Cambridge class, and 3) comprehensibility. The classroom observation sheets contain such variables as identity of the subject, pre-activities (explaining learning objectives, reviewing previous lesson), whilst activities (brainstorming, introducing new concepts, suitability of materials to the students' level of competence, methods/strategies and instructional media, teachers' mastery of materials, post activities (reflection and assessment), and supporting factors (communicativeness of the language used, acceptability, gesture, time management). The three

tests: English, Math and Science addressed to the teachers were developed based on the theoretical concepts of Bloom's (1995) incorporating Low Order Thinking Skills (LOTS) and High Order Thinking Skills (HOTS) with the content-based frameworks. The test on English 10 test items covering the integration of Reading and Writing Skills through answering questions based on certain paragraphs and developing a simple essay. The test on Math 34 test items incorporating questions on Numbers, Geometry, and Handling Data. The test on Science has 42 test items covering the integration of three sub subjects, namely Biology, Physics and Chemistry with three kinds of test types- multiple choice (4 items), matching (1), short answers (31) and explanation on inquiry cases (6). Each of which was developed based on about 60% of lower order thinking skills (LOTS) and 40% of high order thinking skills (HOTS) which refer to Bloom's theory (2005) on the cognitive development.

Each of them was analysed accordingly that is the teachers' personal biodata and interview guide were descriptively elaborated, the syllabi, the lesson plans, the worksheets, and the observation sheets, were scored and described, and the tests were scored and analysed in terms content and language. Each descriptor of some instruments was scored 0 (if the observed standard did not exist), 1 (if the observed standard is partly achieved), and 2 (if the observed standard is fully achieved). Afterwards, the final obtained score is converted using the formula: total score divided by maximum score and then multiplied by 100. Thus, for the syllabus, the maximum score is 30 and the minimum score is 0; for the lesson plan, the maximum score is 40 and the minimum score is 0; for the worksheet, the maximum score is 74 and the minimum score is 0; for the observation sheet, the maximum score is 44 and the minimum score is 0; for the English test, the maximum score is 50 and the minimum score is 0; for the Math test, the maximum score is 39 and the minimum score is 0; and for the Science test, the maximum score is 50 and the minimum score is 0.

FINDINGS AND DISCUSSION

The following is the elaboration of the findings obtained from the instruments and discussion of the findings which include the description of the CLIL-based learning models of both schools, the results of analysis on both pedagogical and professional competences of the three subjects matter teachers from both schools.

CLIL-Based Learning Models of Both Schools

Based on the results of interview and observation, it was identified that both schools have similarities and differences in implementing the CLIL-based learning model as seen in Table 1 below.

Table 1: CLIL-Based Learning Models of Schools A and B

Aspects	School A	School B
Curriculum implemented	National on par with International Curriculum (Shared Curriculum)	National on par with International Curriculum (Shared Curriculum)
CLIL approach (Clegg, 2003)	English : Language-led Math : Subject- led Science : Subject- led	English : Language-led Math : Subject- led Science : Subject- led
Materials	National : Government E-book International : Published Course book	National : Government E-book International : Published Course book
Method and Media	Method : 40% Inductive, 60% deductive Media : used 50% of	Method : 30% Inductive, 70% deductive Media : used 50% of

	Media	: Used in 80% of classroom meetings		classroom meetings
Time Allotment for National Curriculum	English	: 0 hour/ week	English	: 0 hour/ week
	Math	: 6 hours/ week	Math	: 4 hours/ week
	Science	: 4 hours/ week	Science	: 4 hours/ week
Time Allotment for International Curriculum	English	: 4 hours/ week	English	: 4 hours/ week
	Math	: 2 hours/ week	Math	: 2 hours/ week
	Science	: 2 hours/week	Science	: 2 hours/week

Based on Table 1, both schools have implemented shared curriculum, blending the national and international frameworks. By using shared curriculum, learners study selected subject in both first language and in English (Cambridge, 2016). The CLIL approaches were analysed by using Clegg (2003) suggestion. There were two alternative approaches to CLIL, one which *language-led* and another which *subject led*. Language-led tends to import parts of subjects and highlights language development. Subject-led may well exclude language teachers and explicit language teaching. The materials used were also similar for both curricula, yet the published course books used were from different publishers. There were slightly different on the method used and the frequency of using media. School A uses more inductive method than School B and School A uses media more often than School B. The time allotments are similar for both English and Science. Yet, Math gets bigger time allotment in school A.

Results of Teachers Pedagogical Competences

Further, it was discovered that the subject matter teachers (English, Math, Science) in both schools (Schools A and B) scored 60 up to 80 points out of the maximum score 100 for the three kinds of instructional set; syllabus, lesson plan and worksheet, and achieved almost 80 points for the instructional process. The shortcomings varied for each set. Firstly, for the syllabus construction, in general, the teachers lacked detailed information for learning activities, assessment, and learning sources; secondly, the learning objectives in the lesson plan were not completely stated, and there was no modelling in the instructional procedures; and eventually the worksheet did not contain any indicators to be accomplished, and neither pair nor group work was available in doing a task. From the process perspective, the teachers had not fully given opportunities for the students to explore ideas themselves.

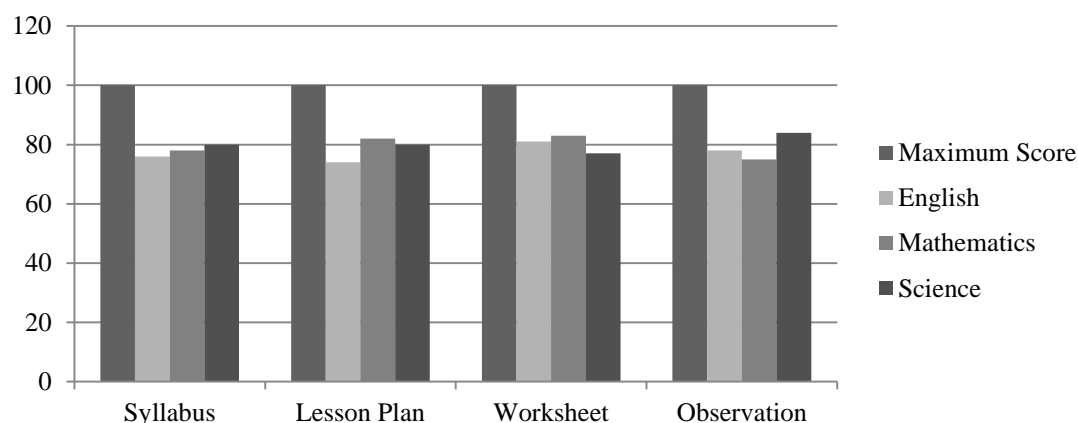


Figure 1: Results of the Analysis of Pedagogical Aspects in School A. Data obtained through observation sheet.

Below is the graph describing the teachers' competences in School B

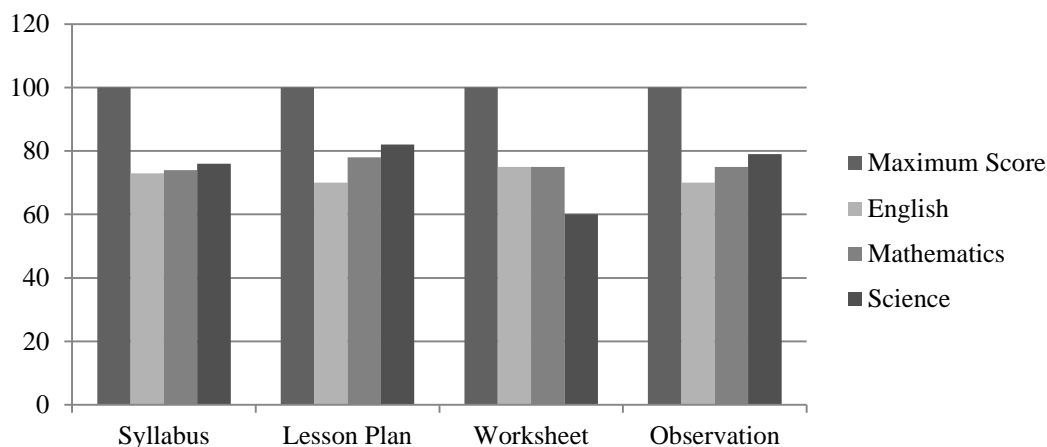


Figure 2: Results of the Analysis of Pedagogical Aspects in School B. Data obtained from instruments for instructional sets

All in all, based on Figure 1 and 2, all teachers have fair pedagogical competence in developing instructional set (syllabus, lesson plan, worksheet), and in conducting instructional process (lack of modeling and inductive way of teaching). As stipulated by Brown (2001), Harmer (2001), Richards (2005) and Piskurich (2006), teachers should be pedagogically well prepared prior to teaching in order to reach at predetermined learning goals.

In the case of math teachers, both teachers have quite similar score which are 77, 5 (School A) and 72.5 (School B). Based on the result of analysis, it was figured out that teacher from school A has been teaching Math for about 4 years and teacher from school B has been teaching Math for about 3 years. Another fact that supports this condition is that the teacher from school A experienced more teacher trainings in using English to teach Math than teacher from School B.

Based on the results of analysis, out of the two subjects, it reveals that 1) both Science teachers (100%) have been teaching for at least two years in Grades VII and VIII right after she graduated from the Department of Physics, Faculty of Math and Science, *Universitas Negeri Malang*, holding a BA certificate. The only short training they joined is the one held by the central government of Indonesia focusing on the procedures of how to employ laboratory instruments.

Further, from the pedagogical perspectives, it was discovered that (1) all science teachers prepared instructional sets (syllabus, lesson plan and worksheet) prior to instructional process, (2) the obtained scores for the instructional sets range from 84 (the highest) to 60 (the lowest), and (3) they attempted to make the students actively involved in the instructional process by conducting a mini experiment using simple instruments (for electricity circuit). The detailed result of analysis of pedagogical aspects is displayed in Table 2 below.

Table 2: Result of the Analysis of Pedagogical Aspects of Science Teachers (Instructional Set)

Subjects	Converted Scores			
	Syllabus	Lesson Plan	Worksheet	Instructional Process
Teacher A	76	82	60	78.4
Teacher B	80	80	77	84

Based on the analysis result in Table 2, we can conclude that (1) the science teachers were fairly competent in developing instructional sets (syllabus and lesson plan) in that some aspects in the sets like identity, formulation of educational goal/indicators, instructional steps, learning sources, instructional media, and assessment were explicitly stated in the planning except that in the worksheet the students were not encouraged to think more critically and asked too many questions due to unclear instructions; (2) for the worksheets, they lacked competences reflected by the indicators of what the students should achieve as well as instructions so the students were not well informed of what to do - whether they had to work individually, pair or group.

As mentioned by Harmer (2001), Richards (2005) and Piskurich (2006) any successful instructional process requires well-set instructional planning which teachers will benefit in any teaching and learning context including in the CLIL-based practices to reach at predetermined learning outcomes. In a CLIL class, according to them, the students should be pushed to think about the content and at the same time about learning in general.

Results of Teachers Professional Competences

The results of teachers professional competences obtained through the designed test for teachers and observation sheet. The result of analysis on professional competence can be seen on Figure 3.

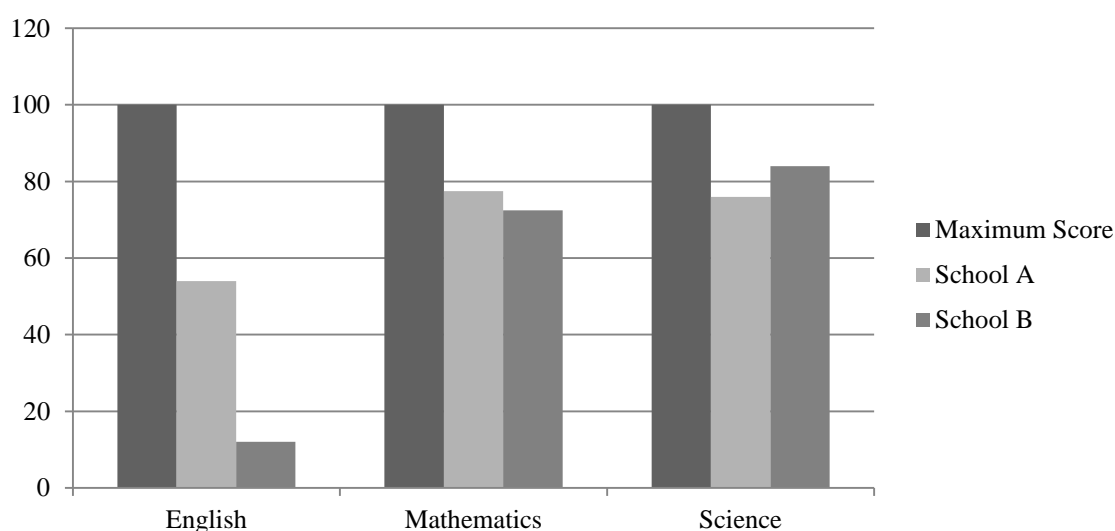


Figure 3: Results of the analysis on professional competence

From the results of English and Math teachers, it was obvious from the graph that the English and Math teachers in School A got better achievement than the one in School B in the professional competence.

Subjects/Converted Scores Teacher School A/76	Language Competence Having a few mistakes in constructing words, phrases, and sentences	Mastery of the Subject Matter	
		Sufficient	Not Sufficient
		31 out of a total 42 (dealing with Biology, Physics, and Chemistry	11 items out of a total 42 dealing with the concepts of Biology (the concept of human body system, making inferences), Physics (about the concepts of electrical circuit,

Teacher School B/60	Having more mistakes in constructing words, phrases, and sentences	27 out of a total 42 (dealing with Biology, Physics, and Chemistry)	force), Chemistry (making inferences) 15 items out of a total 42 dealing with the concepts of Biology (making inferences, the concept of human body system), Physics (about the concepts of electrical circuit, force the act of force), Chemistry (making inferences from a table, describing concepts)
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On the other hand, from the professional viewpoint, the **two** science teachers indicated different levels of mastery in both language and content. Table 3 shows the result of analysis of the teachers' competences, ranging from 84 (the highest) to 44 (the lowest).

Secondly, in terms of language mastery all teachers still had problems in constructing simple nonverbal expressions like the use of tenses, for instance: *bread cannot changed/ changes back to water, salt made from water, ... the current of electricity flow into the material*; the construction of passive voice like *the temperature will be increase,*; the production of complex sentences and use of punctuation in the sentences; missing auxiliaries in sentences like. *the temperature not constant, lamp not on*; misspelled words like ... *make conclution, stomatch*.

Hence, the teachers' inadequate proficiency has been verified by the students' opinions that the teachers used simple English as a medium of instruction during the instructional process except for reviewing the previously explained concepts, asking questions and responding to students' questions. Also, they did not use English in every session. It goes without saying that science CLIL teachers are required to be qualified in both language and content, no matter what CLIL model is implemented in class. The roles of language in CLIL have as great value as content in that the teachers are required to be familiar with grammar/structure, various vocabulary and language functions to transfer the subject matter content. The specific tasks given should use contain grammar structure, vocabulary and subject-related language functions (Harmer, 2012; Coyle et al., 2010; Dale et al., 2012).

CONCLUSION

In general, all teachers have less than five years of experiences in teaching. Since the elementary teachers in Indonesia are required to graduate from Primary Education Department, their educational backgrounds are not fully linear to teach CLIL subjects. All in all, the six teachers from both schools are considered competence in pedagogical aspect, yet claimed as fairly competence in professional aspect. It was due to the fact that some teachers need more effort to develop themselves in terms of skills in language and knowledge on content. At last, the results of observation elicit information that CLIL model instructions in both schools need to be improved.

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