



CLIL for International Class at Mechanical Engineering Program

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ABSTRACT

An ideal approach for teaching subjects using English as its medium of instruction was an urgent need for teachers of international class. CLIL was proposed as one of the solutions for this kind of teachers, especially in the Mechanical Engineering Program of Politeknik Negeri Malang. This program had an international class, but some of the teachers seemed having a bit difficulty to use English to communicate during teaching and learning process. Therefore, this study aimed at investigating the conceptual possibility of applying CLIL on the teaching and learning process. The result of this study contributed to the body of knowledge by providing the way to implement CLIL for international classes at Mechanical Engineering Program.



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1. INTRODUCTION

International class is not unfamiliar nowadays in Indonesian education. Many institutions have already applied this special program whether it is a strategy to gather more students or to implement vision and mission of the institution. However, in every Indonesian educational level, whether it is elementary, a junior or senior high school uses Bahasa Indonesia in their classes. They deliver the learning material in Bahasa Indonesia. Some schools are brave enough to choose to be bilingual or multilingual, but in general school Bahasa Indonesia is still used.

Bahasa Indonesia is also still used to deliver the material or as the classroom instruction in higher education. Instead of using bilingual or multilingual interaction, higher education tends to have international class. So, they open themselves to have collaboration or cooperation with educational institution from other countries in the form of inviting some scholars of the other institution or university or inviting the students to be their students, here in Indonesia.

Having international classes are very challenging. There should be supports from all of the institution components especially the lecturers since they will be directly interact with the students in the classroom. Teachers seem to be the prominent aspect for the successful of international class. However, the implementation of this kind of class emerges obstacles for some teachers and students. One of the obstacles or the problems is the language instruction for both.

Some of the teachers seem like not feeling confident to teach in English, some of them choose to use partial English for the sake of the local students, and the other create their own strategies such as asking the fluent students to explain to the international students who come from other country. Those example situations are from the content teachers' point of views. Those all happen just to achieve the aims of teaching and learning processes.

Beside universities as higher education, polytechnic like Politeknik Negeri Malang also has international class. It covers some majors including mechanical engineering program. Some English classes should teach technical English for the students. That is another obstacle since the English teacher should master any information related to technical terms or engineering too. During the implementation of this international class program, those obstacles happen frequently.

As one of polytechnics that has broad vision to compete globally, Politeknik Negeri Malang also urges the students to have 450 score of TOEIC that is not easy to achieve. All components of the institution should be included

to achieve this goal. Therefore, this study would propose to talk about CLIL that stands for Content and Language Integrated Learning as the solution to those problems. First, it would discuss about what CLIL is and how to implement it in general. Second, it is about a conceptual proposal of implementing it in the teaching of learning process in mechanical engineering international class. These concepts would contribute to the body of knowledge on how to implement CLIL and some recommendation would be generated to the teachers who have the same cases. The term Content-and-Language-Integrated-Learning (CLIL) itself refers to educational settings where a language other than the students' mother tongue is used as medium of instruction (Dalton-Puffer, 2017). In this case, the language that will be integrated is English.

Some research related to this proposed CLIL had been conducted. It resulted in the idea that CLIL significantly improves the cognitive development, cultural awareness and students' motivation to learn foreign languages, without any detriment to content learning in the subjects where it is used (Pancheva and Antov 2017). Along with this finding about students' motivation improvement, CLIL really provides this advantage since Galitsyna (2017) says that the greatest advantage is the sharp increase of motivation to learn foreign language expressed by students. Aguilar (2015) conducted a research about how engineering lecturers teaching in English at a Spanish university view their work, and it was found that they regard English proficiency as a key factor for all stakeholders and finally they think CLIL better suits less proficient students in higher education (Aguilar, 2015). On his research, Uemura proposed a lesson plan that aimed at an undergraduate civil engineering experiential learning class at a university where the majority of learner English proficiency (Uemura). CLIL practice was said providing a systemic process by which to simultaneously advance not only additional language fluency but also adoption of innovative methods across the curriculum (Perez et al., 2018). Another research about CLIL showed that a theoretically justified and experimentally verified model of CLIL in the engineering education proves that the interdisciplinary integration creates optimal opportunities for future engineers and research engineers not only in mastering a foreign language, but also in its forming, on the basis of meta-knowledge, the discussion and enlightenment (educational) culture skills, technical communication skills, digital literacy, and techniques and strategies for effective reading of professional literature (Sorokovykh, et al., 2022). Based on these research results and the cases explained before, CLIL could be the best solution.

2. CLIL AND HOW TO IMPLEMENT IT

CLIL or Content and Language Integrated Learning is proposed to solve the problems explained before. It refers to programmes where academic content is taught through a second or additional language (Lin). Some factors should be considered before implementing CLIL including the operating factors and the scale of implementation. Several the operational factors are the availability of the teachers, language fluency, time allotment, the way of integration (before, embedded, or parallel), and the assessment whether it will focus on content only, content and language, or language only. The scale includes extensive or partial instruction through the vehicular language (Coyle, et al., 2010). As the application of the CLIL teaching could be addressed objectively by means of a SWOT analysis that stands for strengths, weaknesses, opportunities, and threats (Bekteshi, et al., 2020).

Basically, CLIL integrates 4C frameworks including content, communication, cognition and culture. Relating to those frameworks, several principles could be generated. First, content is not only about getting the knowledge and skills but also creating it. Next, it should enable the students to interpret the contents. Third, linguistic demands should be analysed. Fourth, language learned should relate to the learning context. Fifth, interaction and intercultural awareness are fundamental to be considered (Coyle, et al., 2010).

CLIL could be implemented from pre-school up to a tertiary level of education. It generates several models like immersion for pre-school, A1-A3 for primary school, B1-B5 for secondary school, and C1-C3 for tertiary level or higher education. The suitable model for mechanical engineering is a C2 model in which language teaching runs parallel to content teaching.

The phases that can be used in implementations are (1) Identifying and mapping the language demands of an academic unit of work; (2) Designing the teaching/learning cycle; (3) Preparing the task for CLIL; (4) Designing bridging materials; (5) Scaffolding via classroom talks.

3. CONCEPTUAL PROPOSAL OF CLIL IMPLEMENTATION FOR MECHANICAL ENGINEERING

Based on the theory presented in the previous sessions. There is a possibility in implementing CLIL for mechanical engineering international class. Since it should be in C2 model which is language teaching goes hand in hand with content instruction, the implementation could follow these phases:

3.1 Identifying and mapping the language demands of an academic unit of work

The example of this phase uses Metal Forming subject. It is taught in the fourth semester. The subject discusses about a manufacturing process of metal forming. The mapping form is adapted from Lin's study (2016). It could be like this:

Content learning goals/topics	Explaining the stamping process to form metal
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Student's role	Observer
Key vocabulary	Stamping, die, punch, sheet metal, deformation, press, blank, tooling, draw depth, trimming
Language functions	Explaining steps, giving instructions, asking for clarification, expressing preferences
Genre	Instruction manual, technical report, safety procedures, quality control documentation, project proposal

3.2 Designing the teaching/learning cycle (TLC)

This phase is basically like choosing the methods/techniques to teach. There are three stages for TLC: the teacher modelling a text (joint deconstruction and analysis of a text), teacher–student jointly constructing a text and, student independently constructing a text. Based on the curriculum mapping above, the TLC could be:

Table 2. The teaching/learning cycle

Genre/text	Instruction manual
Stage one	Teacher modelling the instruction manual
Stage two	Teacher-student jointly constructing the instruction manual
Stage three	Student independently constructing the instruction manual

It is suggested that stage one and stage two are repeated several times so that the student will eventually construct the instruction manual independently.

3.3 Preparing the task for CLIL

This phase is like creating detail activities that will be done by the teacher and the students. The task structure that can be used is Focus-Task-Evaluate or Prepare-Focus-Task-Evaluate-Elaborate. From table 2. The TLC above, at stage one: the teacher modelling the instruction manual, a task could be developed as below:

Table 3. Task for CLIL

Stage one	Teacher modelling the instruction manual
Focus	Finding information about the instruction manual structure
Task	Watch a video of stamping process and fill in a form
Evaluate	Teacher gives feedback to the student's task

Task's structure Prepare and Elaborate could be added. Prepare means the teacher provides some information and elaborate is when the teacher adds more additional information after the evaluation.

3.4 Designing bridging materials

The bridging material could be done by providing bilingual note approach or multimoda mediation and it could use the L1 language. It seems to be the initial activity before the TLC to build the prior knowledge of the students. So, for an international class the design could use the multimoda and it will be like this:

Table 4. The design of bridging materials using multimoda mediation

Genre/text	Instruction manual
Bridging material	Displaying a printed picture about stamping in the middle of a whiteboard and draw a mind map using it to generate vocabulary

If another video is presented, bilingual note approach could easily be done by turning the subtitle on.

3.5 Scaffolding via Classroom Talk

It categorizes as bridging strategies too. The scaffolding through classroom talk is to help the students understanding the important point of materials. It could be applied in Prepare stage to prepare the students and elaborate stage to help them applying what they learnt to a new context. Basically, this scaffolding just needs the teacher to simply provide the terms of the important or very unfamiliar point in L1.

4. CONCLUSION

CLIL is proposed as the solution of the emerged problems of the implementation of international class in Politeknik Negeri Malang. Based on the presented discussion, it shows that there is a possibility in applying the stages into the mechanical engineering program. Beside it gives a lot of advantages to students' English, the study

program should make sure about the operational factors and determine the scale for CLIL implementation. The shallow discussion of CLIL theoretical framework becomes the limitation of this study. However, further research about the broad implementation of CLIL is recommended.

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