

Needs of Content and Language Integrated Learning (CLIL) in Engineering Students

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Abstract

The purposes of this research were: 1) to investigate the needs of Content and Language Integrated Learning (CLIL) in engineering students; and 2) to study supplemental opinions and suggestions. Research samples were 162 students from Faculty of Engineering, Thai-Nichi Institute of Technology, Bangkok, Thailand. The instrument used for data gathering was a questionnaire with three aspects: Multiple focus; Safe and enriching learning environment; and Active learning.

The research findings were presented as:

1) The overall mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students was at high level ($\bar{x}=4.50$). The highest aspect was at Active learning ($\bar{x}=4.54$), followed by Multiple focus ($\bar{x}=4.52$) and Safe and enriching learning environment ($\bar{x}=4.46$).

2) The suggestions from the respondents were as follows: a) The activities should be based on building on a student's existing knowledge; b) Creative and critical thinking should be added on teaching-learning process; and c) Using current media and materials are important.

Keywords: *Content and Language Integrated Learning Approach, EFL Teaching-Learning Process*



1. Introduction

Content and Language Integrated Learning or CLIL is one of the contemporary language teaching approaches used widely in Australia. There are several definitions of CLIL indicated by many researchers (Liubiniene, 2008; Meyer, 2010; Coyle et al, 2010) as the approach that uses language to learn and learns to use languages. This approach has been gaining in popularity and is influencing ways in which various non-European countries apply the teaching method for bilingual education.

The main components of CLIL are divided into four groups which are Content, Cognition, Communication and Culture. The approach mainly focuses on how to develop the students' own knowledge of specific subjects through a process of critical thinking skills paralleled with using foreign target- language as a medium language of learning contexts and activities (Coyle et al, 2010).

A CLIL classroom, therefore, aims to provide an access to personal and intercultural communication to support the learners' language experience for a variety of needs. Moreover, they may be exposed to different cultures perspectives on the content they are taught. Coyle (2006), further, affirms that CLIL teachers should have a good command of the foreign language as the means of instruction. It could be advantageous if the CLIL teachers are also experts in the subject-content area, and also have a deep understanding of the cognitive, socio-culture and psychological elements of foreign language learning. Jones and Jones (2008), in addition, describe that collaborative skills and self-management skills should be developed through a learning activity in order to prepare the students how to work as a team as and how to plan for a goal achievement. A more radical approach is further indicated by Marsh and Wolff (2007) who states that a CLIL model composes of three areas; language, content and strategies. Recommendation issues of the model are summed up by Jarvinen (undated) as follows:

- Provide plenty of input interspersed with focus on form
- Provide brief interventions of form-focused teaching
- Provide negotiation of form task (in addition to negotiation of meaning)
- Allow L1 use to support meaning-making and problem-solving
- Provide peer-peer scaffolding activities
- Provide opportunities for extended output and challenging interaction
- Provide task for processing and producing challenging oral output
- Ask 'quality' questions with unexpected outcome that cannot be answered in one or two words
- Provide examples of the linguistic expressions of content-related thinking skills
- Practice the linguistic expression of content-related thinking

However, Pica (2002) contends that the teaching-learning strategies to apply CLIL with classroom learning are highly concerned as many unresolved issues are revealed. According to research done by Anuyahong (2012), it was found out that the English proficiency of TNI students are not in a satisfaction level, especially in engineering students. Therefore, it is significant for College of General Education and Languages to find out the strategies to solve these problems and uplift the engineering students' ability. Unfortunately, the notion of CLIL in TNI has not been recognized.

2. Method

The purposes of this study were

- 1) to investigate the needs of Content and Language Integrated Learning (CLIL) in engineering students; and
- 2) to study supplemental opinions and suggestions.

3. Research Methodology

Population and Samples

Population of this study were 280 third-year engineering students in the second semester of 2016 academic year at Thai-Nichi Institute of Technology.

Samples in this study were 162 third-year engineering students in the second semester of 2016 academic year derived through simple random sampling technique.

Instrumentation

The instrument used in this study was a questionnaire based on needs of Content and Language Integrated Learning (CLIL) in engineering students.

The first part (Part 1) of this questionnaire asked for the demographic information on the students' gender. The second part (Part 2) concerned a study of needs of Content and Language Integrated Learning (CLIL) in engineering students. This part comprised 15 items of a study of needs of Content and Language Integrated Learning (CLIL) in engineering students in three aspects: 5 items of Multiple focus; 5 items of Safe and enriching learning environment; and 5 items of Active learning; The five levels of opinion used in the questionnaire were ranked as "The highest needs", "High Needs", "Moderate needs", "Low needs" and "The lowest needs". Responses from the student questionnaires were subsequently coded. The data of the students' coded responses were statistically calculated and analysed. The computation of Cronbach's Alpha as a measure of reliability was employed to indicate how reliable the research questionnaire results were. Reliability was defined as the proportion of the students' responses to each item in the questionnaire and the reliability coefficient or calculated alpha was a lower bound of the true reliability of the research instrument, or the questionnaire. The descriptive statistics was also used



to determine the individual summary statistics for each of the 15 items in the questionnaire.

The third part (Part 3) asked for more opinions and suggestions of needs of Content and Language Integrated Learning (CLIL) in engineering students based on open-ended questions.

Data collection

Needs of Content and Language Integrated Learning (CLIL) in engineering students were accessed through the questionnaire in the second semester of 2016 academic year.

Part 1 concerns the demographic variables about the students' gender.

Part 2 covered needs of Content and Language Integrated Learning (CLIL) in engineering students in three aspects. Therefore, the participants were requested to consider each item carefully and indicate how important each item was for their study. A total of 162 engineering students completed the questionnaire. The students' responses from the questionnaire were subsequently coded using computer program as follows: "1 = male and 2=female" for genders; and "1=the lowest needs, 2 =low needs, 3 = moderate needs, 4 = high needs, 5 = the highest needs" for each of the five levels of importance on 40 items in Part 2.

The analyses of the research data were conducted by means of descriptive statistics. The descriptive statistical analyses of the frequencies and percentages of the students' responses were employed to report their demographic variables and to indicate the rank order of the items in each area of needs of Content and Language Integrated Learning (CLIL) in engineering students listed in the questionnaire. The frequency distributions were analysed to determine the proportions of the students' responses to the five levels of importance on the 5 items in three aspects: 5 items of Multiple focus; 5 items of Safe and enriching learning environment; and 5 items of Active learning. Process analysis was conducted with the second research question in determining the associations of the participants' needs of Content and Language Integrated Learning (CLIL) in engineering students to each of these demographic variables.

Data Analysis

Data analysis from questionnaire both single item and whole questionnaire which presented a form of rating scale. These rating scales were calculated to find out mean and standard deviation and then translated based on criteria developed by Best (1981) as follows:

- 1.00 $\leq \bar{x} < 1.50$ refers to students had the lowest needs.
- 1.51 $\leq \bar{x} < 2.50$ refers to students had low needs.
- 2.51 $\leq \bar{x} < 3.50$ refers to students had moderate needs.
- 3.51 $\leq \bar{x} < 4.50$ refers to students had high needs.
- 4.51 $\leq \bar{x} < 5.00$ refers to students had the highest needs.

The collected data was analysed using computer program. The statistics used for analysing the data were frequency, percentage, mean, standard deviation, and content analysis.

3. Results

Phase 1: The results of demographic data

The analysis of the data from the students' questionnaire was presented in the first section deals with the demographic variables from the students' responses to Part 1 of the questionnaire in the following table.

Table 1: Table of the results of demographic data of respondents

Demographic data of respondents	n=162	Percentage
Gender		
1.1 Male	88	54.33
1.2 Female	74	45.67
Total	162	100

The table showed that percentages of engineering students in gender ranged from 54.33% for male students and 45.67% for female students.

Phase 2: Needs of Content and Language Integrated Learning (CLIL) in engineering students

Table 2: Table of Mean (\bar{x}) and Standard Deviation (S.D.) of needs of Content and Language Integrated Learning (CLIL) in engineering students in overall

No.	Aspects	\bar{x}	S.D.	Level
1.	Multiple focus	4.52	0.73	The highest
2.	Safe and enriching learning environment	4.46	0.71	High
3.	Active learning	4.54	0.79	The highest
Total		4.50	0.74	High

The above table presented that the overall mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students was at high level ($\bar{x}=4.50$). The highest aspect was at Active learning ($\bar{x}=4.54$), followed by Multiple focus ($\bar{x}=4.52$) and Safe and enriching learning environment ($\bar{x}=4.46$).

Table 3: Table of Mean (\bar{x}) and Standard Deviation (S.D.) of needs of Content and Language Integrated Learning (CLIL) in engineering students in Multiple focus

No.	Multiple focus	\bar{x}	S.D.	Level
1.	Supporting language learning in content classes	4.55	0.81	The highest
2.	Supporting content learning in language classes	4.49	0.72	High
3.	Organizing learning through cross-curricular themes and projects	4.58	0.77	The highest
4.	Integrating several subjects	4.52	0.65	The highest
5.	Supporting reflection on the learning process	4.49	0.72	High
Total		4.52	0.73	The highest

The above table presented that the mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students on Multiple focus was at the highest level ($\bar{x}=4.52$). The highest needs were at Item 3 “*Organizing learning through cross-curricular themes and projects*” ($\bar{x}=4.58$), followed by Item 1 “*Supporting language learning in content classes*” ($\bar{x}=4.55$). However, the lowest needs at a high level were Item 2 “*Supporting content learning in language classes*” and Item 5 “*Supporting reflection on the learning process*” ($\bar{x}=4.49$).

Table 4: Table of Mean (\bar{x}) and Standard Deviation (S.D.) of needs of Content and Language Integrated Learning (CLIL) in engineering students in Safe and enriching learning environment

No.	Safe and enriching learning environment	\bar{x}	S.D.	Level
1.	Using routine activities and discourse	4.34	0.78	The highest
2.	Displaying language and content throughout the classroom	4.41	0.71	High
3.	Building student confidence to experiment with language and content	4.61	0.68	The highest
4.	Guiding access to authentic learning materials and environments	4.38	0.69	The highest
5.	Increasing student language awareness	4.59	0.73	High
Total		4.46	0.71	High

The above table presented that the mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students on Safe and enriching learning environment was at a high level ($\bar{x}=4.46$). The highest needs were at Item 3 “*Building student confidence to experiment with language and content*” ($\bar{x}=4.61$), followed by Item 5 “*Increasing student language awareness*” ($\bar{x}=4.59$). However, the lowest needs at a high level were Item 1 “*Using routine activities and discourse*” ($\bar{x}=4.34$).

Table 5: Table of Mean (\bar{x}) and Standard Deviation (S.D.) of needs of Content and Language Integrated Learning (CLIL) in engineering students in Active learning

No.	Active learning	\bar{x}	S.D.	Level
1.	Students communicating more than the teacher	4.52	0.87	The highest
2.	Students evaluate progress in achieving learning outcomes	4.54	0.75	The highest
3.	Students help set content, language and learning skills outcomes	4.56	0.81	The highest
4.	Teachers acting as facilitators	4.62	0.88	The highest
5.	Negotiating the meaning of language and content with students	4.47	0.65	High
Total		4.54	0.79	The highest

The above table presented that the mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students on Active learning was at the highest level ($\bar{x}=4.54$). The highest needs were at Item 4 “*Teachers acting as facilitators*” ($\bar{x}=4.62$), followed by Item 3 “*Students help set content, language and learning skills outcomes*” ($\bar{x}=4.56$). However, the lowest needs at a high level were Item 5 “*Negotiating the meaning of language and content with students*” ($\bar{x}=4.47$).

Phase 3: Suggestion from the respondents

The suggestions from the respondents were listed as follows:

1. The activities should be based on building on a student's existing knowledge.
2. Creative and critical thinking should be added on teaching-learning process.
3. Using current media and materials are important.

4. Discussion and Conclusion

1. The overall mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students was at high level ($\bar{x}=4.50$). The highest aspect was at Active learning ($\bar{x}=4.54$), followed by Multiple focus ($\bar{x}=4.52$) and Safe and enriching learning environment ($\bar{x}=4.46$).

2. The mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students on Multiple focus was at the highest level ($\bar{x}=4.52$). The highest needs were at Item 3 “*Organizing learning through cross-curricular themes and projects*” ($\bar{x}=4.58$), followed by Item 1 “*Supporting language learning in content classes*” ($\bar{x}=4.55$). However, the lowest needs at a high level were Item 2 “*Supporting content learning in language classes*” and Item 5 “*Supporting reflection on the learning process*” ($\bar{x}=4.49$).



3. The mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students on Safe and enriching learning environment was at a high level ($\bar{x}=4.46$). The highest needs were at Item 3 “Building student confidence to experiment with language and content” ($\bar{x}=4.61$), followed by Item 5 “Increasing student language awareness” ($\bar{x}=4.59$). However, the lowest needs at a high level were Item 1 “Using routine activities and discourse” ($\bar{x}=4.34$).

4. The mean score of needs of Content and Language Integrated Learning (CLIL) in engineering students on Active learning was at the highest level ($\bar{x}=4.54$). The highest needs were at Item 4 “Teachers acting as facilitators” ($\bar{x}=4.62$), followed by Item 3 “Students help set content, language and learning skills outcomes” ($\bar{x}=4.56$). However, the lowest needs at a high level were Item 5 “Negotiating the meaning of language and content with students” ($\bar{x}=4.47$).

5. The suggestions from the respondents were: 1) The activities should be based on building on a student's existing knowledge; 2) Creative and critical thinking should be added on teaching-learning process; and 3) Using current media and materials are important.

5. References

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