

## **CLIL Implementation in Selected STEM Departments at the University of Sulaimani**

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### Abstract

English language has influenced and occupied the world in many aspects such as economic, social, political and educational system. Kurdistan Region is no exception in this regard. Learning English, as a foreign language (EFL), has been the demand of the majority, which led to the emergence of EMI (English as a Medium of Instruction). All these termed for an innovative form of education, content and language integrated learning (CLIL) has been the response. CLIL is an educational method by which subjects are taught through a foreign language with dual-focused aims, namely learning the content, and learning a foreign language simultaneously.

This paper is about the implementation of CLIL in the selected science, technology, engineering, and math (STEM) departments at the University of Sulaimani. It presents how some selected teachers, on individual basis, have implemented CLIL method in the STEM departments voluntarily. The study hypothesizes that it is more effective to learn English language in integration with the content.

As a result, this study finds out that learning a language through content is one of the best methods to have control of both knowledge and language together at the same time.

**Key words:** CLIL, EMI, implementation, STEM, cooperation

## Introduction

Nowadays English language plays a major role in the progress of Globalization as it is considered one of the most significant languages for increasing diversities of work force with different system values in the importance of its communication. Learning English is reflected as a hope and a window to be part of the worldwide sphere of influence by the majority of societies. English is not just a lingua franca (ELF); rather it is extended to almost every aspect of life including economy, business, science, and culture, among others. The potential speakers of English have raised varieties of approaches to learning and teaching routes. The scientific study of language and its structure particularly Applied Linguistics is another phase in which it faced a paradigm shift from basic research of native language speaker to the second language multiplicities.

In the recent years, the use of ELF has influenced education, publication, conferences and many other related parts, in addition EMI has mushroomed in higher education from such expenditure. EMI holds different methods, and CLIL is one of them. It is a dual focused approach for enhancing the learning of content with a foreign language (mostly English), which is not the mother tongue for most of the learners. In 1994 David Marsh introduced this approach in the field of education with the aim of preparing bilingual graduate students for the labor market in the most effective way, primarily in terms of content and language proficiency.

To introduce new approaches in education, all training programs, pedagogical developments and staff preparation are required. Presenting and implementing CLIL have been practiced for decades in Europe, USA, Canada, and recently in Asia. Kurdistan Region of Iraq is another territory, which is introduced to this approach by the Consulate General of the United States of America in Erbil, Iraq with collaboration of the University of Denver and the Ministry of Higher Education.

## Justification

As a Kurdish/Iraqi national, my didactic and qualified experiences have been involved with teaching in Tertiary (Higher) education system for several years, since 2014, in my home city Sulaimani, Iraqi Kurdistan, predominantly at STEM Departments. Throughout this period of time, lecturers in general have struggled with teaching the foundation book that the Ministry of Higher Education of Kurdistan has established. The materials, methodology, and content inside the book do not meet the needs of the participants and students in particular. It has been ongoing trials for us as lecturers to keep changing the content and the methodologies to be compatible with STEM Departments' needs but concluded with no solid resolution in return. On the other hand, in 2018 the Consulate General of the United States of America in Erbil, Iraq has inducted and initiated the Content and Language Integrated Learning (CLIL) approach with collaboration of the University of Denver. Consequently, my indorsed contribution with the aforementioned prospect has further developed my educational career and started to focus on the practice of methodology on CLIL approach, particularly in teaching first year's general English course at STEM Departments; to meet the needs of the supporters at the University.

Arguably, teaching the English language without the integration of the content at the STEM Departments will be impractical. Students should be actively engaged with the foreign language and the content, instead of mimicking the materials of the course book. CLIL is the solution because it does not require curricular change, neither time extension in the schedule. In view of that, this study will consider and instigate a subjective approach on the active implementation of CLIL in selected STEM Departments at the University of Sulaimani. The purpose is to ascertain if CLIL helps to give any motivation for learning and teaching English language and how it affects student's reflection on the learning process. Even though, CLIL is in the process of recognized practice particularly in Europe, USA, and many other countries though this will be the first time to be applied at the University of Sulaimani.

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## Procedure

First and foremost, CLIL method has been implemented lately in the researcher's lectures; in the recent General English classes, to initiate the practice of advancement. The process cooperated with four university teachers from selected STEM Departments at the University of Sulaimani.

Without doubt, the researcher's training forte originated with a thorough participation in teaching University STEM courses in an English workshop for fifteen days, conducted by the Consulate General of the United States of America in Erbil, Iraq. Then the researcher's tutoring employed a CLIL workshop for two days at the University of Sulaimani for the STEM Departments. Afterward, the participants conducted a workshop in their departments to further familiarize CLIL as an innovative scheme for content and language teaching and learning.

The researcher's consecutive collaboration with a teacher from the Physics Department has enlightened her didactic training to further mobilize her improvement. Each week, the Physics teacher was sending content materials to implement language activities to apply CLIL approach in the general English classes. Accordingly, both of content and language teachers were having discussion on social apps about the obstacles, solutions, and challenges encountered during the CLIL implementation.

The group effort with the other three STEM Departments was by means of email correspondence and voice recordings. Then a face-to-face interview took place with the content teacher in the College of Agricultural Sciences (ARD) Department, as later an additional collection of emails and voice recordings were exchanged, predominantly on shared content and language integration ideas and activities for an active CLIL enactment. Others from Media and Computer Sciences Departments were on the go to send their communal voice recordings by explaining the techniques and strategies of the way they had implemented CLIL approach in their content classes.

Therefore, teachers and learners would arguably and meaningfully design technology-based learning experiences in STEM curriculums, as they can evidently cooperate with ease and can be further certified to be a convenient path that everyone can share their ideas, suggestions, and know-hows. In view of that, all the partakers have shared various lesson plans and strategies in which they implemented CLIL. Though on account of the limit of this project, this study has only selected portions of those lesson plans and focused on the CLIL implementation parts for the reader.

## Theoretical Background: EMI

English as the rapidly growing lingua franca of the world is the latest trend in the field of education. English Medium Instruction (EMI) is defined by Dearden (2014) as the use of the English language to teach academic contents in territories and jurisdictions where the first language (L1) of the population is not English. Crystal (2003) estimates the continuously increasing users of the English language to more than 329 million first language speakers and more than 422 million second language speakers inhabited over 75 countries. In today's globalized world, the use of English language is not restricted to educational fields; this indispensable competence has extended into virtually all domains in various fields like business, politics, economy, and others.

English language in today's age is no longer limited to the medium of communication or used as an international language (EIL) among native and non-native speakers. English as a lingua franca (ELF) has become a sub-discipline of Applied Linguistics. ELF is the default language at international conferences, global research centers and scientific studies. It has occupied and shifted the local L1 in academic publications and higher education of the majority population in the European Union, Middle East, South East Asia (Gundermann, 2014) and Kurdistan Region of Iraq is no exception

English is the medium of instruction for most of the fields in the higher education of Kurdistan Region of Iraq, as the majority of Bachelor's, Master's, and PhD's programs are offered in EMI. Furthermore, the Ministry of Higher Education in the Region has demanded the prospective students of Master's and PhD's to prove their language competence in English by a predefined TOEFL, IELTS, and PERSON scores with their application.

The history of EMI in the Region of Kurdistan and the University of Sulaimani in particular has offered the use and implementation of EMI as one of the rules and regulations in the university's legislation. The educational infrastructure endeavored to support quality EMI for the STEM departments, and Kurdish and Arabic languages for the Humanities, since the Region is a multicultural territory. Teachers, in the Humanities, were allowed to use Kurdish and Arabic languages as a medium of instruction, under the condition of using English language for preparing materials and resources as a main tool.

The strive for applying EMI inside Kurdistan Region's Higher Education was very hard and faced many obstacles from 1992 till 2003 because of the political and financial issues. After 2003, when the international and local embargos ended, ELF has been influencing Kurdistan's region of Iraq enormously and continuously. Many attempts inside the University of Sulaimani have risen once more for implementing EMI. Various American, British, and European native instructors worked to bring and expose Kurdistan's educational sectors including University of Sulaimani to English language practice. In addition, most of the bilingual Kurdish and English skill-sets returned back home and brought EMI to implement it inside the University of Sulaimani. The brief history of EMI revealed for this study that the implementation of EMI had been individual based rather than institutional based. In other words, owing to the aforementioned reasons, the University of Sulaimani's infrastructure could not unify the implementation of EMI, and it is in the process of being established (Arif, 2019)

The EMI Oxford (a center based in the University of Oxford's Department of Education) has conducted a research in 55 countries about English as a medium of instruction in a growing global phenomenon, in which one can relate the issues, challenges and the shortages of the University of Sulaimani to the results of the conducted research. However, Dearden (2014) has concluded that there is a deficiency of linguistically qualified teachers; it seems like there is a limited professional organizations or pedagogical guidelines to support effective EMI. Besides, EMI is introduced in a quite some way from a global understanding of its goals and consequences. This phenomenon is presented by a top-down authority and education managers, rather than involving stakeholders and consulting them. EMI Oxford calls for an urgent research-driven approach that consults and measures the complex process involved in EMI both on the learning of academic subjects and on the acquisition of English proficiency.

### **Why CLIL?**

The intensity to learn English is unimaginable as the struggle to learn it is the world's new mania. In today's age the Kurdistan Region is no exception as the shift from EFL is growing to EMI for STEM departments expressly. EMI is a broad term in which it holds other domains of teaching English language approaches – one of these approaches is CLIL. Coyle, Hood and Marsh (2010:25) define CLIL as a “dual focused educational approach in which an additional language is used for the learning and teaching of both content and language.” One has to differentiate between CLIL and EMI as stated by Dearden (2014) there is a conceptual separation between EMI and CLIL. On the one hand, CLIL is contextually placed for Europe citizens initially then again EMI has no particular contextual origin. What is more, EMI's main concern is to use English language as the mean of instruction whereas CLIL does not refer to a particular foreign or second language for teaching academic subjects. Likewise, it is not necessarily for EMI to have the same objective as CLIL; from its name, CLIL's main goal is to integrate content and language both simultaneously.

Furthermore, Puffer (2007:1) declares that due to the internationalization and globalization the education system should be improved and provides students with necessary skillsets to ground them in international contexts. “For obvious socio-political reasons” countries try their best to further afford CLIL education with English as a medium of instruction. In other words, as Zafiri and [jzsb.univsul.edu.iq](http://jzsb.univsul.edu.iq)

Zouganeli (2017) point out that CLIL raises the notion of foreign language teaching and learning using content subjects. Although language and content objectives are tightly mingled, sometimes emphasis may be placed more on one and less on the other, according to the context and its requirements

Coyle, Hood and Marsh (2010 p.137-138) assert that CLIL does not support linguistic competence only, besides, it enhances and improves cognitive skills. CLIL can aid the process of the conceptualization, improves the understanding of concepts, and expanding conceptual mapping resources. CLIL can be understood conceptually by the 4Cs framework, which was proposed by Coyle and it is essential for effective classroom environment. This framework consists of the integration of four contextualized building entities: “content (subject matter), communication (language learning and using), cognition (learning and thinking processes), and culture (developing intercultural understanding and global citizenship)”. Moreover, CLIL can improve intercultural communication skills, target language competence, and raises greater awareness of both L1 (first language) and L2 (second language ). In terms of content, it facilitates the access to subject-specific terminology, and prepares for future studies and working life.

### **CLIL Workshop and Teacher Training**

Different universities inside Iraq and Kurdistan participated in the Teaching University STEM Departments in English workshop from April 29th till May 10<sup>th</sup> 2018 in Erbil. The participants were university lecturers from public and private universities, teachers from primary and high schools, and curriculum coordinator from the Kurdistan’s Ministry of Higher education. The university lecturers and schoolteachers were from STEM Departments and English language departments. The general objectives of the workshop were:

- Exploring differences between EMI, ESP, CBI, and CLIL program frameworks.
- Introducing CLIL and its benefits
- Working CLIL through the Analysis, Design, Development Implementation, and Evaluation model (ADDIE).
- Developing confidence in providing needs-based content and CLIL courses.
- Discovering useful resources and strategies to apply in the teacher’s context.

The Region has been fuelled by the need to upgrade foreign language proficiency and this intensive training program tried to achieve sustainable learning outcomes. CLIL was introduced for the first time by Mrs. Swartley from the University of Denver. It is worth mentioning that Mrs. Swartley is an M.A holder of instructional systems development, ESL concentration, and has B.A in English writing and sociology. She is a teaching assistant professor and special program coordinator, English for specific purposes specialist, adjunct ESL instructor, curriculum coordinator, and English communication tutor.

The program was continuously training the participants, with regards to Fernandez and Canado (2012) advice: to shift the teacher-controlled banking model of education to a more social-constructivist, in other words, teachers should pass the torch to the students to lead the learning and stop being the donors of the knowledge and start to become a facilitator.

However, the main goal of the Teaching University STEM Departments in English workshop was to prepare the participants to apply CLIL actively and to conduct training courses themselves when they are back to their universities and schools. The University of Sulaimani was one of the universities that ran a successful workshop to introduce CLIL to sixteen STEM Departments. The workshop was managed by the Language and Culture Centre of the University of Sulaimani with the cooperation of the English Department instructors. Two instructors were active participants: Ms. Raman Qalandar (myself) and Dr. Rebeen Kareem as two representatives of the University of Sulaimani. Ms.Raman holds an M.A in English Language and Linguistics with a B.A in English language and literature; besides having thorough English communication skills and TESOL background. Along with, Dr.

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Rebeem Kareem for having a PhD in English language and linguistics with an M.A in TESOL; he is also the curriculum coordinator.

The objectives of the University of Sulaimani's workshop program were:

- Overviewing some traditional teaching methods, and offering new trends methods in the field of teaching.
- Introducing CLIL and clarifying the differences between EMI, CBI, and ESP for the STEM participants.
- Explaining and suggesting how an academic lesson plan sheet is written.
- Participants should work in groups and apply what they have learned in day one.
- Participants demonstrating what and how they already teach their content classes in day two.
- The workshop instructors should evaluate and help the participants to integrate language with the content classes simultaneously so as to have dual-focused objectives.
- Participants should conduct a workshop themselves for their departments after their return, and introduce CLIL and its objectives to their colleagues.

Mrs. Swartley and the Consulate General of the United States were very cooperative to persuade and help "CLIL workshop" inside the University of Sulaimani. They offered the materials (PowerPoint slides, books, and articles) and provided each participant with a certificated dedication from the consulate itself to encourage and motivate the lecturers.

### **Challenges Inside the University of Sulaimani**

In the Region, English language is taught as a foreign language from elementary until high school, under the law. Traditional grammar approach and drilling are used heavily to teach this lesson, as a consequence, when students attend university they are not able to communicate effectively in English. There is a compulsory general English lesson that students in the first year of university in STEM and Humanities Departments should take. In general, most of the language teachers, who teach general English class, suffer because of the following reasons:

- Lack of authentic materials, which does not match student, department, and university needs.
- Students' English language level is not to the standards and they suffer from language anxiety, and are almost beginners or elementary.
- Not enough time: as having one and half hour in a week is not enough to learn and practice the four skills.
- Large classrooms, almost 65 to 70 students in one class.
- Lack of enough non-departmental English teaching staff.
- Lack of training programs for the involved teachers in teaching general English class.

One can notice that students face many difficulties in learning English language, let alone a content class being taught in English. As a result of the above mentioned points, content teachers at the University of Sulaimani find it difficult to teach through English language. In addition, there are challenges that content teachers and students always suffer at the University. The same case is mentioned by Janssen (2016), in which she claims that teachers fear that their English level is not sufficient enough to teach their subject in the same way and at the same level as in their native tongue. Some STEM teachers in the University of Sulaimani do not teach their content class in English because they are afraid they may fail the course because of their own unsatisfactory language teaching skills. This is quite obvious in other universities also but it is common in some cases that teachers are forced to teach their subjects in English with poor English aptitudes. Another challenge, in most of

the STEM Departments in the University of Sulaimani, is that the classes are more content-driven and the cognitive demand of subject matter is more than the linguistic one.

CLIL experts from the University of Cambridge (2011) suggest some valuable recommendations for teachers to overcome the challenges they encounter. Previously argued, the language teacher at the University of Sulaimani, who helped the content teacher at the Physics Department, followed these instructions literally, and the results were mesmerizing. The language teacher decided to teach General English class in CLIL, the content teacher offered help to know how to explain scientific concepts, it is prepared to answer questions about these concepts, and widen his/her knowledge of science vocabulary and its pronunciation.

### **Teacher Collaboration**

There are many evidences and researches prove that the main reason for CLIL success is the collaboration between language and content teachers. One of these successful collaborations is the one between the language teacher and content teacher, examined in this study, at the University of Sulaimani.

Coyle, Hood and Marsh (2010) affirm that to learn a language one should use it, a successful language use must involve authentic interactive settings rather than emphasizing heavily on grammar. Learners have to use the vehicular language to learn content otherwise grammar approach will not give any satisfactory results and this would not be CLIL. Likewise, for a fruitful CLIL results, language-learning process should not be disregarded because it plays an essential role in the whole learning process. This goal could be achieved by the teacher cooperation.

An important question remains: how can a learner use a second or foreign language to learn content? CLIL is the answer, but as Coyle, Hood and Marsh (2010) assert one should know that teaching content integration with language is not the same as teaching a subject in a foreign language. In CLIL settings, language teachers and subject teachers need to collaborate with each other to organize and formulate an efficient didactics for a real integration of form and function in a language teaching. Sometimes, this collaboration can be challenging due to the difficulties for a teacher to find all the support she needs like pedagogical, linguistic, practical, and even psychological supports. Teacher support group is the solution, as Georgiou (2011) suggests, they can keep in touch through telephone, email, and periodical meeting. Selected STEM Departments at the University of Sulaimani as a stepping stone toward the implementation of CLIL, formed teacher support group, they communicate on Google classroom, social apps, having periodical meetings, and exchanging voice recordings.

Vazquez (2014) observed that this collaboration might lead to a controversy due to the difficulty of making foreign language teachers and content teachers understand the necessity of shifting some approaches in their classes to support the objectives of CLIL context. The solution for this problem would be that the language teacher can teach in advance the linguistic functions, grammar structures, and certain related vocabulary to the content, as a result students will be equipped with necessary knowledge of the language that is required to use successfully in the content class. One should not forget that the features of the context will determine the choice of one model or another. The needs of the teachers and linguistic competency of the students will determine the implementation procedure of a coordinated CLIL program.

Moreover, there are two substitute approaches to CLIL: one that is language-led and focuses mainly on language development and imports parts of subjects, while the second one is subject-led and it might eliminate language teachers and ignore language teaching (Coyle, Hood and Marsh, 2010). In addition Beardsmore (1993) emphasizes that there is no single blue print of content and language integration that could be applied in the same way in every country, and this is due to the influence of the social situation of each country and the decisions of the stakeholders in educational policy.

Supporting Beardsmore's claim, the teacher collaboration at the University of Sulaimani is between myself as the language teacher and the content teacher from one of the selected STEM departments. Taking Physics Department in the College of Education as an example, the language teacher and content teacher, who teach mechanical physics, worked together to implement CLIL in both classes. Due to some time management and schedule issues, both teachers tried their best to embed CLIL in their course book and adjust it with the requirements of the department and the university, and most importantly with the needs of the students. However, in CLIL's partial immersion settings, when the students' linguistic ability is not highly skilled, the setting-up of an organizational model based on the teamwork between the subject teacher and the language teacher "may contribute to raise the standards in two different dimensions: the learning and consolidation of academic content, and the improvement of the linguistic capacity of the students" (Vazquez, 2014: 115-127). One can say that, the results of this research at the Physics Department of the University of Sulaimani have proved the previous quotation, and the contribution for sure helped a successful CLIL implementation.

CLIL was partially immersed in some of the selected STEM Departments in the University of Sulaimani because of the mentioned challenges and striking results appeared at the end of the year. Perhaps, students at the beginning of the year did not know what is a lab report and how it should be written, but the continuous contribution of the content and language teachers helped improving the writing skills and understanding the content. To achieve a successful CLIL implementation results, the selected teachers took their views into consideration; the levels of the English language within the students, supporting the lack of content knowledge by language teachers, and overcome the difficulties of language learning by content teachers. Teachers kept exchanging skills, experiences, and sharing mutual support.

### **CLIL Cooperation**

One of the techniques that teachers at the University of Sulaimani are following, in CLIL implementation, is the cooperative learning, due to the large number classes almost 65 to 70 students in one class. Gil (2010) asserts that to achieve certain tasks, cooperative learning is very helpful in which learners can be categorized into small work groups with the aim of encouraging peer instruction, peer review, and peer support. The cooperative learning techniques helps to decrease learner's language and content anxiety, encouraging learning, enhances motivations, and facilitates interaction and negotiation among students.

Moreover, Vygotsky (1978), the social psychologist, proposes some theories in psychology, which influenced CLIL, and one of them is MKO (the most knowledgeable other). It is a theory in which he states that one learns from somebody, whose knowledge is more than one's do, and that person does not necessarily have to be a teacher, he could be a peer, parent, or any expert. MKO supports team work and cooperative learning in which coaches are prepared to work with learners, and not just teachers giving instructions and students taking notes. As Marsh (2007) declares "CLIL is more learning by construction rather than learning by instruction." Social constructivist approach to learning believes and encourage active student-led to be the core of learning rather than giving instructions and fill their memory bank and be passive reception of knowledge. Since CLIL is influenced by constructivist assumption, it promotes active cooperative learning. This kind of technique is achieved successfully by scaffolding, in which the teacher, other skillful learners, resources are involved in help with a framework and supporting the learning process. According to Coyle, Hood and Marsh (2010) any beginner likes to engage with someone with a proficient background when they face new challenges and interact with new knowledge to develop their individual thinking.

Another segment of Vygotsky's (1978) theories is ZPD (zone of proximal development), which deals with the area of growth. He assumed that human's growth as a person is different with what she/he can do with support that's called scaffolding (with the help of an expert) from what she/he can do; that difference is the zone of proximal development. In addition, scaffolding is one of the essential elements in CLIL for the main objective of CLIL is guiding and supporting language production. As per Gil (2010) suggests, CLIL should scaffold the relationship between language and content teachers. Freeman and Anderson (2011) declare that the major role of the teacher in Communicative Language Teaching (CLT) is to work as a facilitator and establish communication with the students. The teacher should work as an advisor and monitors students' performance during the activities. At the end, scaffolding is not a permanent technique that goes with the students: once the learner reaches the required level in terms of content and language, the scaffolding is taken away and allows the learners to continue their path by their own.

### **Teachers' Profile and CLIL Implementation**

After taking the intensive training program for introducing and applying CLIL in Kurdistan, selected teachers at the University of Sulaimani set themselves some goals to achieve and lift the rapid change and development in the field of education. Therefore, the University of Sulaimani made its efforts toward the implementation of CLIL approach.

Implementing CLIL is considered one of the innovative ways of language learning, and its features and emphasis vary according to the requirements of the specific region. The aim of the implementation at the selected STEM departments in the University of Sulaimani was to promote English language learning and comprehending the content.

In CLIL implementation, selected teachers at the University of Sulaimani were very aware of identifying materials because most of these materials are designed and offered from the Internet (online sources) for an advanced level of learners. For this reason, an appropriate language was assigned that serves their objectives and suit the students' level; at the same time teachers were careful about not simplifying everything too much and kept the difficulties to develop gradually with the level of the students. In implementing CLIL approach in this way, teachers made sure that learners were exposed to enough language and content materials progressively so as to students become independent learners.

Teachers at the University of Sulaimani followed Georgiou's (2011) guidelines for the beginning stages of CLIL implementation. I suggested that learners should be told in the early stages of CLIL since they are learning in a new approach and new language. Fresh students at the University of Sulaimani used to learn in their mother tongue, therefore, they need to be given a justification why this shift happened in their education.

After conducting a workshop at the University of Sulaimani, some selected teachers in STEM departments participated in implementing CLIL as a first step. The selected departments were Physics Department College of Education, ARD Department College of Agriculture Sciences, Computer Department College of Sciences, Media Department College of Humanities, with the cooperation of English Department College of Languages.

I personally teach advanced conversation at the English Department and general English at the STEM Departments. Having taught EFL since 2010, I also teach general English at the Physics Department, College of Education. This is my first time to implement CLIL at the University of Sulaimani with the collaboration of Rangeen, who teaches fresh students Mechanical Physics, at the Physics Department. It is worth mentioning that Rangeen earned her MPhil degree in particle physics at the University of Sheffield, and then she obtained her PhD from Cardiff University.

Both of us have volunteered and worked to implement CLIL in the Physics Department. One of the reasons that made Rangeen one of the best candidates for this project is that she has a considerable experience in English language especially academic writing and research methodology. The teachers'

main objectives, in their career as university lecturers, are to establish a bilingual environment for the students and enable them to learn English language along with the content classes.

Although there were 65 students in one class, which was a huge challenge for both of us, we insisted on CLIL implementation and hoped for promising results. Students had a two hours class of general English once a week, four hours theoretical class of mechanical physics and two hours laboratory of mechanical physics in a week. Each week, the content teacher was sending her lesson plan and content material to the language teacher, while the language teacher was inserting language activities and building lesson plan integrating mechanical physics subjects into the language classes. One can say that each week the language teacher was tailoring a specific lesson plan that has a dual focus on language and content. The aims were to promote English language learning, better comprehension of the material, linking the content key messages and language key messages to the real life and market needs.

One of the CLIL implementation samples was video recordings about pendulum. The content teacher sent details about pendulum motion, and how it moves in English. Then, the language teacher taught the students the related vocabulary and definitions about pendulum. The students were asked to work in-group and record a video about how a pendulum moves. The purpose behind such type of activity was to combine Coyle's 4Cs elements and engage students to practice them. Furthermore, the goal of this activity was the same as Alejo and Piriz's (2010) opinions, which is to insert practical knowledge and modern activity that engage students with the lesson. In addition, such activities are more applicable for CLIL implementation. One should admit that CLIL implementation was difficult for the students at the first, but gradually they figured out that the process of language learning is developing and it is natural. At the end, students progressed their knowledge about pendulum (content), improved their communication skills by using English for speaking and conveying their ideas in the video recording. In terms of cognition, students improved their thinking skills by linking concepts formation and understanding language. In addition the fresh students were exposed to alternative perspectives and became aware of otherness and self.

Furthermore, Hemin is another university teacher who implemented CLIL in the University of Sulaimani in agribusiness and rural development (ARD) department College of Agriculture Sciences. He has MA in sustainable agriculture and food security from the UK. As a content specialist, Hemin has a thorough grounding in his subject area Horticulture and ARD; in addition, he worked in a trading company and business as a supervisor to the accountants. Then he started his teaching career at the University of Sulaimani in 2010. In term of language specialty, Hemin knows Kurdish, Arabic and English. He worked as an ALT (Assistant Language Teacher) for two years in Japan, as well as studied the Japanese language for one year. Because of these qualifications and profound experiences in terms of content and language, he was the top candidate to be selected to implement CLIL in his college.

Following the character Dniel by Alejo and Piriz (2010), Hemin, as well, was aware of his role as a CLIL teacher; he transferred and applied all the activities and pedagogical program he learned throughout his experience in his CLIL implementation project. He was one of the CLIL workshop participants in the University of Sulaimani, and conducted a CLIL workshop in his department. He applied an adjunct model of integrating content and language to promote bilingualism in the early stages with the fresh and sophomore students. CLIL was a challenge for him, but his main objective was to establish a change and shift from the traditional shell of teaching, he used trasnlanguage technique (see L1 role) as a tool for overcoming language obstacles in CLIL implementation.

However, Hemin has various successful CLIL lesson plans of how he implemented this approach and dedicated couple of them to this research. As a consequence of the limit of this work, this study selected and summarized one lesson plan. One of the CLIL lessons was a research methodology class for the junior students with high elementary level in English at Hemin's Department. After the warm-  
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up and instruction in English, in the guided practice stage, the teacher divided the class into mini groups and asked them to brainstorm a topic to do a research in English. Students had to write few introductory lines either in English or in their L1, but they had to translate it back and present it for the teacher and the class in English. This activity helped to discover an interesting fact which was: students knew how to express in English, no one left behind, and this was a promising result for Hemin. The second CLIL implementation he shared was at the Food Science and Human Nutrition Department, in the food factory management class for the sophomore students with a high elementary level of English. The lesson was about production management, and the teacher involved reading, listening, and speaking activity in teaching the content class.

At the beginning of the class, the teacher gave instructions and clarification of the content and language area for practice, each student as a result knew his part and the tasks he was supposed to do. The teacher integrated a short video that suits and services the CLIL class, which was about a day with a British production manager speaking in RP. The goal behind this lesson was certainly to show the life of a manger, his works, how he practices his daily activities, introducing new techniques and traditions of food supervision, and how management in Britain is different from the one in Kurdistan. Students were taking notes while listening, shared their opinions and what they have comprehended from the video with the class and teacher in English. Likewise, the students were asked to rewrite the notes, make a peer review, and give a short presentation in English about the video's topic.

One can notice in both lessons, Hemin followed Coyle's 4Cs framework (content, cognition, culture and communications) (Coyle, Hood and Marsh 2010) in this class, successfully. In the first and second lesson plans, students were cognitively engaged with content learning, they developed a higher level of thinking skills. In cultural terms, in the first lesson plan, Hemin encouraged an English greeting technique to break the tension that happened in the presentations of the topics, they learned how English people introduce themselves, and became aware of this tradition. In the second lesson plan, he introduced another culture of a food production management life and tradition; an example of the way a manager lives his day in Britain. Moreover, in terms of communication, students in both classes presented their topics and opinions in English language, as they learned introductory phrases, vocabulary, sentence structure, active listening techniques, writing skills and paraphrasing. As Coyle, Hood and Marsh (2010:39) stated that "language, culture understanding, cognitive engagement and thinking are all connected to the content and context of CLIL". Students are involved in each of the above lesson plans; they were practicing the activities and applying each skill by themselves with teacher scaffolding. As a result, the learning process of both content and language was equivalent.

Media and Computer Departments are other selected departments, which participated in the implementation of CLIL approach in their classes. Barham, from the Media Department, got his MA degree in international political communication from the University of Sheffield. He is a professional in the role of new media in transition, political communications and public relation. He teaches various classes: marketing, news writing, and English language for mass media. Barham was generous enough to share his techniques of CLIL implementation, as he uses code switching, as a tool for communication with the students. In terms of language and media, he is required to focus on the morphological part of the English language, historical background, sociolinguistics, various types of sentence structure and communicative grammar along with the content material. The teacher focuses on different language games for CLIL implementation to encourage students to involve and be part of the learning process. For example, in one of the lessons, after warm up and giving instructions, students practiced creating news out of an accident by using question words in English language. Barham raised a title in his class and divided the students into groups and gave each one a task. The students had to create questions for news out of the given title, practice using question words in English, write statements and change active sentence into passive ones.

Another new CLIL implementation can be found in the Computer Department. Tara is a computer science assistant lecturer at the University of Sulaimani, and she earned her MA in computer science from JNTU in India. Just like Hemin and Barham, she is using code switching between Kurdish and

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English languages in her class for instructions, clarifications, and to reduce stress on the students. Tara shared a portion of her lesson plan in which she implemented CLIL when she said that most of her content classes' materials include too many explanations and discussions along with many mathematical subjects immersed. CLIL helped her to have a dual focused plan to teach the English language, and to not deviate from the content materials and satisfy the stakeholders in her area. In one of her computer graphic and vision classes, she pre-taught the needed vocabulary with definitions in English. To involve students and develop their thinking skills, the teacher asked the students to bring English-English dictionaries and predict other synonyms and antonyms to paraphrase the definitions and rewrite them in their own words in groups. Furthermore, she asked the students to restate the Kurdish instructions in English and present them for the class.

In a nutshell, such type of activities by Barham and Tara include critical thinking, communication, cultural awareness, and content learning. In the Media Department, the teacher focuses mainly on implementing culture awareness whenever possible in his CLIL lessons because it is one of the components in content learning in the field of media. Furthermore, Tara's main objectives are to reduce the memorization of the content, and enhance cognitive thinking and communication in English. Therefore, the students improved self-confidence, mainly in comprehending the content, and the ability to play with words to express and discuss. Both teacher implemented language activities along with the content material in purpose to make sure students start using the target language. Equally Benjamin Franklin said "Tell me and I forget. Teach me and I remember. Involve me and I learn".

### Conclusion

This paper has discussed and argued the reasons for CLIL Implementation Approach at selected STEM Departments (Physics, Computer Science, ARD, and Media) at the University of Sulaimani, Iraq. This line of approach will prove useful in expanding our understanding of how to further reflect on CLIL in its broadest term as this new understanding in our ethos should help to improve predictions of the impact of Higher Education in Iraqi Kurdistan. Besides, this study lays the groundwork for future research into a qualitative emphasis on the integration of content with a foreign language in a specific teaching framework for the benefits of teaching and learning aspects.

This project gained some noticeable findings from the CLIL implementation at the University of Sulaimani, but one of the more significant conclusions to emerge from this study is that it appeared that CLIL has language and content academic potentials, and it adds diversity and flexibility to existing methods and forms of classroom practice. Also this study has identified that CLIL helps universities with reference to achieving international certification goals.

This research has also shown that both teacher-training program and teacher cooperation are very useful and aid the process of teaching a foreign language simultaneously with the content. The subjective experiences employed in this study as well confirm that the methods used here may well be applied anywhere in the Region, as per code switching or translanguaging can overcome many concerns about learning process, for the reason that it decreases language learning anxiety and content comprehending stress.

There is one important point to mention, however, that CLIL implementation in the selected STEM Departments at the University of Sulaimani facilitated some aspects to the teachers, for instance, there are no need for lots of time expansion and deep-rooted change in curricula for implementing CLIL approach. As well, this approach helps to involve students in the process of learning and shift the class from teacher-led to student base learning which engages different types of learners in various activities.

In a few words, with regards to the findings of this project into consideration, it can be argued that CLIL seems to be a fruitful approach to implement for language and content learning along to create a bilingual student who is well equipped with necessary knowledge about her/his field and ready for the life outside the class.

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