REPORTS OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN
ISSN 2224-5227
Volume 2, Number 312 (2017), 161 – 166

UDC 372.85

Satilmis Yilmaz

Suleyman Demirel University, Kaskelen, Almaty, Kazakhstan
halit.yilmaz@sdu.edu.kz

TEACHING OF NATURAL SCIENCE SUBJECTS IN FOREIGN LANGUAGE BY USING CONTENT BASED INSTRUCTION

Annonation. In Kazakstan, there is an aim to teach science subjects in foreign language. However, there is a problem of how to teach science subjects in foreign language. For solution of this problem, this study aims to investigate appropriation of three models of content-based instruction and comparision between three models of CBI (content based instruction) and CLIL (content and language integrated learning) for teaching natural science subjects. Content-based education is considered not only as acquiring the skills of language, but also acquiring the content knowledge of natural science subjects. The advantages and disadvantages of each model of CBI and CLIL were explained for the teaching content of any subject with foreign language. Analysing three models of CBI and CLIL, which are aimed at the content and language teaching, the author proposes suggestions in terms of teaching timing and order. After the method has been identified, teachers should be trained how to teach language through content and how to teach content through language by the teaching methods of CBI and CLIL in accordance with teachers` level of language and content.

Keywords: secondary education, natural science teaching, content-based learning, teaching models of content based teaching, content and language integrated learning.

One of the issue discussed in Kazakhstan schools in the field of education is a teaching science courses in a foreign language. Especially if courses are described in the current issue of the English language. There are some approaches for teaching science courses; one of these approach is to learn foreign language for science teachers. In this situation, science teachers learn English language later, they did not learn during their undergraduate or graduate education. For example, if chemistry teacher do not know English, he or she can tell chemistry contents by learning English language later. The second approach is particularly in middle school to describe only terms of science content by science teacher. The next approach is science teaching in English during education program of teachers. Ideally to be teachers during the undergraduate program of Science in English and have completed undergraduate education is to succeed in English. Then the teacher can tell the subject lessons as English.

In Kazakhstan, there are some studies about science teaching in foreign language by publishing book, guide book and articles. One of these is a teaching tool recommended by the National Academy of Education named after Y. Altynsarin. The purpose of the guide book, taking into account the low level of multilingualism in secondary school students, to develop methods of teaching natural sciences in Kazakh and English language. In this guide book, taking into account the English language problem for Kazakh school science teachers, it is concluded that science teacher can teach science materials in collaboration with the English teacher (1). In addition, according to method presented by Bulatbaeva (2), it is described the way of teaching non-linguistic disciplines (biology, physics, computer science, mathematics, etc.), in three or more language, in accordance of cognitive-communication approach.

In this study, we will present a new approach that is content based teaching to solve above problem. In the presentation of content based instruction (CBI), three models of CBI and the relation between CBI and Content and Language Integrated Learning (CLIL) will be compared.

Content and Language Integrated Learning (CLIL): Besides content based instruction, there is an approach to integrate content and language that is Content and Language Integrated Learning (CLIL). Dale & Tanner predicted the differences of Content-Based Instruction method (CBI) and Content and

Language Integrated Learning (CLIL). They explained that CBI deals with teaching content in language lessons whereas CLIL deals with teaching a subject during teaching language. CLIL lesson is divided into two lessons; CLIL language lesson and CLIL subject lesson. But in CBI language teaching, teachers teach second language through content [3]. We think that CBI lessons are the first and then CLIL lessons should be. CLIL lessons are needed to have more language skills than CBI lessons. CLIL lessons are more academic than CBI lessons. In Kazakhstan, a study has been done about CLIL by the National Academy of Education named after Y. Altynsarin [4]. This study guide deals with learning principles, approaches, forms and teaching technologies of science and mathematical course subjects (informatics, physics, chemistry, biology, science), including CLIL technology (content and language integrated learning), evaluation system of pupils' knowledge in integrated learning at the lessons of English language and informatics, physics, chemistry, biology, natural science. CLIL is Content and language integrated learning approach. CLIL refers foreign language learning as a necessary tool in the teaching of other subjects. That is, through language learning in any subject, and therefore it is content course in a foreign language lesson, not a foreign language course. This approach makes possibility to carry out teaching the two courses at the same time, but the main emphasis is possible on language or discipline.

Content-Based Instruction: Content-based teaching is a teaching method that emphasizes learning the language and content together [5]. Stoller persuaded that content based instruction (CBI) has a great potential to promote content and language learning. It should be convenient for both content and language teaching [6]. Subject and language are taught at the same time. Subject is a tool to teach the language or language is a tool to teach content. Therefore, the content-based teaching learners with language skills and knowledge of content find the opportunity to develop. Content-based instruction, rather than the language of instruction curriculum revolves around content or information [5, 204]. Larsen-Freeman, D. predicted that content-based teaching, rather than teaching the language curriculum revolves around content or knowledge. The basic element advocated in training of content focused instruction is that the understanding of language acquisition will occur in the content [7].

Richard Rodgers gives two basic principles of content-based instruction [5, 204-207]:

1. Language acquisition is more efficient than learning the language itself in the use of learning other lessons.

2. Content-based is aimed at teaching students to learn a second language and prepares students for academic studies.

Similarly Brinton, Snow and Weschler argue that Content-based training fulfill some basic conditions in the language of instruction [8, 23]:

1. Content-based instruction will appeal to students' interests and needs;
2. Prepared in the target language to be used by students;
3. Built on previous learning experience of students;
4. Provides a focus on the sustainability of the use of the language;
5. Serves the necessary conditions for learning languages by providing meaningful uses of language.

There are three content-based language teaching models: theme-based, adjunct, and sheltered models. Adjunct and sheltered models are based on learning second language and aimed to use the materials for teachers in regular in English courses.

Theme-Based Model: This model makes integrated language skills learned by the subject (e.g., urban violence, intercultural contradictions in the marriage practices of the world's natural wonders or broader issues such as change). Topics to be interesting for the students, it should allow the implementation of various language skills and be available to talk about the absolute subject. Topics are selected universally by students from topics that can have very little information. Today this is the most useful and the most common form of content-based instruction and is available in so many innovative textbook. This model helps to develop language skills. Therefore, language acquations is rather more serious than content knowledge.

Adjunct Model: In adjunct model language and content model are taught separately, but coordination has been carefully provided. This model is mostly made of applications and tested in colleges and universities. It is aimed to coordinate between language and content courses to improve academic success. It is intended to establish close links. Depending on the specific objectives as defined by subject area teachers to develop the language skills and concepts of content is the purpose of this model. The

coordination problem can be encountered in this model. Providing in the course of compliance and fulfilling as equal responsibility requires a special effort.

D. Brinton M. and A. Snow [9] said that this model is realizing by attending both teaching second language learners and native English speakers by means of a supplied with course content and language courses. The focus of teaching is different in these courses, but although content is the same. Content teacher emphasizes academic concepts and the language teachers emphasize academic skills such as reading and writing. In this model, language and content teachers need significant coordination. Usually, the language teacher requires extra effort to be familiar with the content. For the utility of this model, students have language skills and language level of students is to be enough. Students should be prepared in special language programs. S. Davies, [10] and M. Met [11] explain adjunct model as two coordinated courses: a content course and a language course. In this model language and content are taught separately, but coordinated care is provided. In adjunct model [12], the language teacher tries usually for an extra effort to be familiar with content because students could not have enough language skills. B.C. Dupuy [13] says that students are enrolled concurrently in content and language course that are paired in adjunct courses.

In this model, adjunct courses are often taught in addition to the main course. It`s objective is to acquire significant and target concepts or words within note-taking and text scanning of reviewing and providing students with study skills and listening. An additional benefit of these courses from other is helping to provide convenience to the understanding of terms and topics with learning academic concepts and improving academic writing skills. Both language and contents are important in an adjunct program. Both are separately given by teachers and separately emphasized.

Sheltered Model: Subjects are taught according to students' level of competence in a second language with simplification by bringing together a group of students of insufficient foreign language. The reason of calling “sheltered” is by providing special support given to regular staff and help understanding. Two teachers work together to teach a particular subject. One teacher content expert and the other is a second language specialist. Two teachers in the class can teach together or be divided in half between the two classes at the same time in the classroom. For example, content experts give a short lecture and then check to see if students understand the important words of English. This is a team work and education. It needs the plan and course assessment of the teaching works closely with teams of teachers. Sheltered model [12] known as the cause of helping learners to understand the lessons given to a special support will be provided regularly.

In this model, learning contents are more prominent rather than language learning. This model is implemented on insufficient classes in terms of language skills. The essential objective is to understand content because of not enough the language level of students.

Table 1 - The overview of three models of Content-based Instruction

	Sheltered	Adjunct	Theme-based
Teacher	Content and language Teachers	Content and language Teachers	Language Teacher
Focus	Content	Content and Language	Language
Language Level	Not enough	Enough	Enough
Lesson Format	Integrated course	Separated course	Language course
Problem	Coordination of two Teachers	Relation subject of content matter and Language matter	Selected special daily topics as content subjects

Discussion

Three models of the content-based teaching are mentioned and their features are shown in the Table 1. The implementation of above methods changes according to the purposes and objectives. These models are preferred in accordance with the language level of students and learning objectives of the class. For students with inadequate language skills sheltered model is appropriate, though, the theme-based should be used for students with adequate language skills and if it is developed their language skills. The adjunct model should be used in class where it is aimed both content knowledge and language skills. If the language and content lessons are passed by both teachers in separate time, the adjunct model is used. In this model, language teacher helps to correct errors caused by the content teacher and students and to

develop language skills during the teaching of the content matter. The coordination is very important. This is limiting factor of this model. The solution to this problem is the course to be passed by a single teacher with teaching integrated content matter and language education in the same lesson of content and language. This is ideal. However, it is limited to teach integrated content and language because of cannot be found like teachers. It can be problem that it usually can not to be the language teachers with content experts or the content teacher with language skills. Perhaps, the content teacher with language skills can be educated in higher universities.

On this subject, Met [11] reported that which of the three models have been working on content-based instruction are dependent on benefits in teaching and to achieve the goals. A better understanding of these three models presented below figure 1. This indicator is based on models highlighted focus direction between the language and content. Focusing both content and language appears in the adjunct model and support each other in content and language to be targeting the best teaching.

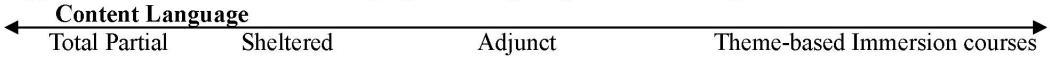

Figure 1 - Integration of content and language in Language teaching (Met, 1999)

It would be more appropriate to be taught by content teachers with content matter knowledge. Language teachers cannot be taught the content matter. Because language teacher focuses on the language skills, content teacher focuses on the topics of content. It is needed to be intermediate or more at least to understand content. The terms of the content to be taught and understood by learners requires a certain level of language. Therefore, the appropriate model is adjunct model. In this model, content and language it is emphasized both. Shortly, for content teaching in foreign language, first is language learning at appropriate level, second is content learning for students with an appropriate language level. These aspects should be considered when adjunct model is implemented. Among the models of CBI, without theme-based CBI used, since sheltered and adjunct models require a partnership of the language teacher with a content-area specialist [14].

Table 2 - Comparison of Content – Based Instruction Models

Sheltered model	Adjunct model	Theme-based model
It emphasizes learning content instead of language	It emphasizes learning both content and language	It emphasizes learning language instead of content
Content experts and second language teachers give lessons in the classroom together. Special support is given with auxiliary members. Language lesson is given for the half of class and content lesson is given for the other half of class at the same time in the same or other classroom	The language and content taught separately, but coordination is meticulously supplied. The aim is to establish a link between language lessons and content courses to improve academic success in college.	Teaching is done by creating a team of content experts and foreign language teachers.
It is applied for insufficient foreign language	Students should be at the intermediate or advanced level and have enough language skills	Students should be intermediate or advanced level language

Results

The essence of content-based teaching is content teaching through language and language teaching through content. This is a kind of interdisciplinary study that combined the science of teaching the foreign language will be carried out. Thus the teaching of basic concepts of sciences with this method will be easier, streamlined and attractive. The development of language skills and achviement of students can be performed with content-based instruction. CBI can help to overcome problems during content teaching in English at schools.

If we were to rank for content teaching in foreign language; firstly foreign language teaching, then content based instruction (CBI), and then content and language integrated instruction (CLIL). We can give some recommendations of the research outcomes:

- The content-based instruction models should be needed to be better identified according to learning objectives and outcomes.

- Content and language teaching should be coordinal during teaching process.

- This research can be used as resource and course material to implement teaching methods used in content and language teaching.

- During the instruction of content based, language teachers should establish on the accurate information of the content in the sample sentences and text. Chamot and O'Malley had said that content comprehension and content concepts is utilized as learning tool for academic learning [15].

- Teachers should be trained how to teach language, content based and language-content integrated in accordance with teachers` level of language or content.

REFERENCES

[1] Method of teaching of natural sciences with multi-language in secondary schools. Guidance book, The National Academy of Education named after I. Altynsarin, Astana, 2013, p.53.

[2] Bulatbaev K.N. A question semantization new vocabulary at functional-communicative learning a foreign language // Materials of the Republican scientific-practical conference "Actual problems of development of teacher education in the Republic of Kazakhstan, devoted to the 40th anniversary of the training of teachers with higher education in Pavlodar region", V.1, Pavlodar State University, 2002. - PP.143-148.

[3] Dale.L, Tanner R. CLIL Activities (A resource for subject and language teachers), Cambridge University Press, 2012, p.4.

[4] Integrated learning to English language and science and mathematical course subjects (informatics, physics, chemistry, biology, science). Guidance book, The National Academy of Education named after I. Altynsarin, Astana, 2016. 300 p.

[5] Richards J.C., Rodgers T.S. Approaches and Methods in Language Teaching. Cambridge University Press, New York, 2001.

[6] Stoller F. L. Content-Based Instruction: A Shell for Language Teaching or a Framework for Strategic Language and Content Learning, TESOL, Salt Lake City, Utah, 2002.

[7] Larsen-Freeman, D. Techniques and Principles in Language Teaching. Oxford University Press, Oxford, 2000.

[8] Brinton, D., Snow, M. A., & Wesche, M. Content-based second language instruction. New York: Newbury House, 1989.

[9] Brinton, D. M. and Snow A. The Adjunct Model of Language Instruction: Integrated Language and Content at the University, Report of Center of Language Education and Research, Los Angeles, 1988.

[10] Davies, S. Content Based Instruction in EFL Contexts, The Internet TESL Journal, 9 (2), 2003.

[11] Met, M. Content-Based Instruction: Defining Terms, Making Decisions. NFLC Reports, Washington, DC: The National Foreign Language Center 1999.

[12] Yilmaz S., Doganay Y., Guvercin S., Islam A. Teaching Concepts of Natural Sciences to Foreigners through Content-Based Instruction: The Adjunct Model, English Language Teaching, Vol. 8, Canada, 2015. P. 97-103.

[13] Dupuy B.C. Content Based Instruction: Can it help ease the transition from beginning to advanced foreign language classes, Foreign Language Annals, 33 (2), 2000.

[14] Kızıltan N., Ersanlı C.Y. The Contributions of Theme-Based CBI to Turkish Young Learners' Language Development in English, Journal of Language and Linguistic Studies, Vol.3, No.1, 2007. P.133-148.

[15] Chamot, A.U. and O'Malley J.M. A Cognitive Academic Learning Approach : An ESL Content- Based Curriculum, National Clearing house for Bilingual Education, Report Paper. – Washington, No.1, 1986. P.133-148.

ЛИТЕРАТУРА

[1] Негізгі орта мектепте жаратылыстану циклы пәндерін көп тілде оқыту әдістемесі. Әдістемелік құрал, Ы.Алтынсарин атындағы Ұлттық білім академиясы, Астана, 2013, 53 б.

[2] Булатбаева К.Н. К вопросу семантизации новой лексики при функционально-коммуникативном обучении неродному языку // Материалы Республиканской научно-практической конференции «Актуальные проблемы развития педагогического образования в РК, посвященной 40-летию подготовки педагогических кадров с высшим образованием в Павлодарской области», Т.1, Павлодар, ПГУ им.С.Торайгырова, 2002. – С.143-148.

[3] Dale.L, Tanner R. CLIL Activities (A resource for subject and language teachers), Cambridge University Press, 2012, p.4.

[4] Ағылшын тілін және жаратылыстану-математика бағытындағы пәндерді (информатика, физика, химия, биология, жаратылыстану) кіріктіріп оқыту.Оқу әдістемелік құрал, Ы. Алтынсарин атындағы ҰБА, Астана, 2016, 300 б.

[5] Richards J.C., Rodgers T.S. Approaches and Methods in Language Teaching. Cambridge University Press, New York, 2001.

[6] Stoller F. L. Content-Based Instruction: A Shell for Language Teaching or a Framework for Strategic Language and Content Learning, TESOL, Salt Lake City, Utah, 2002.

[7] Larsen-Freeman, D. Techniques and Principles in Language Teaching. Oxford University Press, Oxford, 2000.

[8] Brinton, D., Snow, M. A., & Wesche, M. Content-based second language instruction. New York: Newbury House, 1989.

[9] Brinton, D. M. and Snow A. The Adjunct Model of Language Instruction: Integrated Language and Content at the University, Report of Center of Language Education and Research, Los Angeles, 1988.

[10] Davies, S. Content Based Instruction in EFL Contexts, The Internet TESL Journal, 9 (2), 2003.

[11] Met, M. Content-Based Instruction: Defining Terms, Making Decisions. NFLC Reports, Washington, DC: The National Foreign Language Center 1999.

[12] Yilmaz S., Doganay Y., Guvercin S., Islam A. Teaching Concepts of Natural Sciences to Foreigners through Content-Based Instruction: The Adjunct Model, English Language Teaching, Vol. 8, Canada, 2015. P. 97-103.

[13] Dupuy B.C. Content Based Instruction: Can it help ease the transition from beginning to advanced foreign language classes, Foreign Language Annals, 33 (2), 2000.

[14] Kızıltan N., Ersanlı C.Y. The Contributions of Theme-Based CBI to Turkish Young Learners' Language Development in English, Journal of Language and Linguistic Studies, Vol.3, No.1, 2007. P.133-148.

[15] Chamot, A.U. and O'Malley J.M. A Cognitive Academic Learning Approach : An ESL Content- Based Curriculum, National Clearing house for Bilingual Education, Report Paper. – Washington, No.1, 1986. P.133-148.

ӘОЖ: 372.85

Йылмаз Сатылмыш

Сулейман Демирель университеті, Каскелен, Алматы қ., Қазақстан

МАЗМҰНҒА НЕГІЗДЕЛГЕН ОҚЫТУ ӘДІСІН ПАЙДАЛАНА ОТЫРЫП ЖАРАТЫЛЫСТАНУ ПӘНДЕРІН ШЕТ ТІЛІНДЕ ҮЙРЕТУ

Аннотация. Қазақстанда оқыту жүйесінде, пәндерді шет тілінде оқыту мәселесі алға қойылды. Алайда, жаратылыстану пәндерін шет тілінде қалай үйретуге болады деген сұрақ бар. Осы мәселені шешу үшін, зерттеу жұмысында жаратылыстану пәндерін оқыту жүйесінде мазмұнға негізделген оқыту әдістері (CBI) мен мазмұн және тілді интеграциялап оқыту (CLIL) әдістері колданылды. Мазмұнға негізделген тілдік білім беру тек тілдік дағдыларын алу емес, сондай-ақ пәндердің мазмұнын түсіну болып саналады. Сонымен қоса мазмұнға негізделген оқыту әдістері және мазмұн және тілді интеграциялап оқытудың артықшылықтары мен кемшіліктері түсіндірілді. Мазмұн мен тілді бірге оқытудың барлық түрлеріне талдау жасалып, оқытудың мерзімі мен тәртібі тұрғысынан ұсыныстар жасалды. Мұғалімдердің мазмұн және тілдік деңгейлеріне қарай, осы айтылған әдістемелерге байланысты біліктіліктерін артыру жұмыстары жүргізілу керек екені айтылды.

Түйін сөздер: орта білім, жаратылыстану пәндерін оқыту, мазмұнға негізделген оқыту, мазмұнға негізделген оқытудың модельдері, мазмұн және тілді интеграциялап оқыту.

УДК 372.85

Йылмаз Сатылмыш

Университет Сулейман Демирель, Каскелен, Алматы, Казахстан

ПРЕПОДАВАНИЕ ПРЕДМЕТОВ ПО ЕСТЕСТВЕННЫМ НАУКАМ НА ИНОСТРАННОМ ЯЗЫКЕ С ПОМОЩЬЮ ИНСТРУКЦИИ НА ОСНОВЕ КОНТЕНТА

Аннотация. Образовательные институты Казахстана ставят целью преподавание естественных наук на иностранном языке. Однако, как преподавать научные предметы на чужом языке? Как сделать предмет понятным и интересным? Данное исследование было проведено для решения этой проблемы. В статье изучается опыт использования трех моделей обучения и сравнение между тремя моделями: CBI (контент на основе инструкций) и CLIL (предметно-языковое интегрированное обучение) на основе контента для препо-давания естественных научных дисциплин. Контент на основе образования рассматривается не только как приобретение навыков языка, но и приобретение знания в области естественных наук. Преимущества и недостатки каждой модели CBI и CLIL в преподавании естественных наук были проанализированы и объяснены. Анализируя три модели CBI и CLIL, при котором изучают содержание предмета одновременно с изучением языка, автор выдвигает свои предложения по поводу времени и порядка преподавания дисцип-лины. После ознакомления с методом учителя должны быть обучены как преподавать язык через содер-жание и как учить контент через язык с помощью методов преподавания CBI и CLIL соответствующий уровню их владения языком и контентом.

Ключевые слова: среднее образование, обучение естественное наука, контент на основе инструкций, модели обучения на основе контента, предметно-языковое интегрированное обучение.

Сведения об авторах:

Йылмаз Сатылмыш - кандидат педагогических наук, декан факультета юриспруденции и социально-гуманитарных наук, университета С. Демиреля.