

Cognitive Discourse Function and Multimodal Conceptualization: The Interactive Usage of Language, Multimodality, and Cognition in Bilingual Teaching Context

Tiffany Ying Yu Lin, National Taipei University of Education, Taiwan

The Asian Conference on Education 2023
Official Conference Proceedings

Abstract

This study aims to examine the realization of Cognitive Discourse Function and multimodal conceptualization in the context of bilingual teaching materials in Taiwan elementary schools. Based on a usage-based cognitive analysis, our data will classify how different categories of Cognitive Discourse Function (CDF) can be realized through language and multimodality in bilingual teaching and learning contexts to enable bilingual teachers to instruct and guide the students to achieve the educational goals and to help the students comprehend and conceptualize the abstract, complicated, or new concept, take the actions, and present their ideas or opinions through the learning process. This study proposes to extend previous findings on language and multimodality and incorporate the tenets of Cognitive Discourse Function to adopt the cognitive usage-based analyses to examine the teaching materials, including bilingual text books and multimodal resources. This study aims to demonstrate that the interactive use of language and multimodality not only helps to achieve the cognitive discourse functions efficiently but also enables the students to (1) facilitate the interpretation process when they start to learn new things or difficult concept; (2) strengthen the motivations to achieve educational goals effectively; (3) create the opportunities to reach the shared goals; (4) learn to help, share, and cooperate with each other through multimodal conceptualization, interaction, and engagement in the classroom.

Keywords: Cognitive Discourse Function, Multimodal Conceptualization, Bilingual Teaching, Multimodality, Educational Goals

iafor

The International Academic Forum
www.iafor.org

Introduction

Background: The Link Between Bilingual Education and Cognitive Discourse Function

As bilingual education received nationwide attention and developed rapidly in Taiwan, Content and Language Integrated Learning (CLIL) (Coyle, Hood & Marsh, 2010) has been a significant approach for bilingual teachers to integrate content, literacy, and language in several courses, including bilingual science, art, physical education, and integrative activities, in the elementary schools in Taiwan. CLIL is a dual-focused educational approach in which a second or foreign language is used for the learning and teaching of both content and language in an academic subject. However, previous CLIL research addressed the specific-subject learning goals and the language proficiency respectively over the past decades. While the importance of integration of “the content and language” is receiving more attention, more studies shift the focus to the issue of academic language competence that progresses knowledge construction and meaning-making, which contains cognitive structure and concept formation (Coyle & Meyer, 2021). In addition, according to Communicative Competence (Hymes, 1972), the original conception of concept is necessary to include communication in educational context. Therefore, recent studies on Cognitive Discourse Function (CDF) (Dalton-Puffer, 2013; Coyle & Meyer, 2021) claim that CDF could serve as the useful link to (1) connect between language learning and subject education, (2) integrate the process of conceptualization and communication, and (3) equip learners with the linguistic competences that are required for educational success with deeper learning in the CLIL classroom. Operating at the interface between thinking and language, CDF, the conceptual integration of subject and language pedagogies, plays a crucial role in deeper learning. The fundamental idea of CDF is to consider speech acts as verbal action, which means that verbalizations are connected to cognitive processes or strategies of the curricular content. CDF construct (Dalton-Puffer, 2013) links “subject specific cognitive learning goals” with the linguistic representations they receive in classroom interactions.

Previous research on Cognitive Discourse Function mainly focused on the usage via verbalization and classroom interaction in CLIL Physics, Finance, History, Chemistry (Breeze & Dafouz, 2017; Morton 2020, Evnitskaya & Dalton-Puffer 2020) which are the subjects for middle school, high school, or higher education in Austria, Spain, and other countries in Europe. However, CDF has rarely been examined and analyzed in the subjects of elementary education yet. Therefore, this study aims to fill the research gap by extending the CDF construct, which involves seven categorization of verbalizations that express acts of thinking about academic content in the classroom, into Taiwan elementary bilingual classrooms to find answers to the questions of what and how CDFs serve as the link between content and language in those contexts. This study would be using the CDF construct as a model of examining local CLIL bilingual educational context in Taiwan based on the multimodal data that combines not only verbalization but also the multimodality used to achieve learning goals through classroom interaction, hoping to provide a cognitive function-based analysis to contribute to bilingual education for teachers and students in elementary schools in Taiwan and worldwide.

Extending the previous studies on language, multimodality, and cognition (Lin, 2015; Lin & Chiang, 2016; Chen & Lin, 2021), this study incorporates the tenets of Cognitive Discourse Function (Dalton-Puffer, 2013) to adopt the cognitive function-based analyses to examine the multimodal aspects of bilingual classroom data, including the authorized teaching materials with open access. Although previous studies mainly focus on CDF emerged from

verbalization and classroom interaction, this study emphasizes that the interactive usage of “language/verbalization” and “multimodality” in CLIL classroom altogether helps to achieve the cognitive discourse functions efficiently, enable the students to facilitate the interpretation process when they start to learn new things or complex concept, strengthen the cognitive discourse functions to achieve learning goals, develop cognitive skills for creating joint attentions and shared goals, and learn to help, share, and cooperate with each other through multimodal conceptualization, interaction, and engagement in CLIL classroom activities.

The Cognitive Discourse Function (Cdf) Construct: The Link Between Content and Language

Based on the conceptual foundation of applied linguistics and education research, Dalton-Puffer (2013) points out that the CDF construct lies in the relationship of language and thought. Regarding the function of language, linguistic representation arises from usage events. Speech act theory also shows that intentional verbal actions could achieve a goal which might be non-verbal. In this case, CDF could reach the goal of making subject-specific thought observable; that is, students can interact the academic content verbally with each other, using recurring linguistic patterns in the classroom. Therefore, the basic idea of the CDF construct is that speech acts as verbal action, which means that verbalizations are connected to cognitive processes or strategies of the curricular content. It enables educators to communicate across subject boundaries as well. While the CDF construct could be thought as the crisscross of academic learning goals with the linguistic representations of cognitive process, it proposes seven basic categories that are called “CDF types”. Each type is based on an underlying communicative intention formulated in pragmatics. In other words, these seven verbal actions are not only individual thought-processes but are acts of communication that are to be performed in fulfillment of curricular demands at the same time as shown in Table 1.

<i>Function Type</i>	<i>Communicative Intention</i>	<i>Label</i>
<i>Type 1</i>	I tell you how we can cut up the world according to certain ideas	CLASSIFY
<i>Type 2</i>	I tell you about the extension of this object of specialist knowledge	DEFINE
<i>Type 3</i>	I tell you details of what can be seen (also metaphorically)	DESCRIBE
<i>Type 4</i>	I tell you what my position is vis a vis X	EVALUATE
<i>Type 5</i>	I give you reasons for and tell you cause/s of X	EXPLAIN
<i>Type 6</i>	I tell you something that is potential	EXPLORE
<i>Type 7</i>	I tell you about sth. external to our immediate context on which I have a legitimate knowledge claim	REPORT

Table 1. CDF types and underlying communicative intentions (Dalton-Puffer, 2013)

Additionally, every CDF type does not stipulate which linguistic verb students have to perform. There is an accommodation of different (subject-) cultural models since its designations are not essentialist. What’s more, to remember all the CDFs, the construct should be constrained, which can facilitate its operationalization and enhance its usefulness as a heuristic. Dalton-Puffer developed the CDF construct as illustrated in Table 2, including seven communicative intentions, the CDF types (central column), the performative verbs (right column), and the communicative intentions (left column). The construct of CDFs links “subject specific cognitive learning goals” with the linguistic representations they receive in

classroom interactions (Dalton-Puffer 2013:220). Each type is based on an underlying communicative intention (left column).

In other words, these seven verbal actions are not only individual thought-processes but are acts of communication that are to be performed in fulfillment of curricular demands at the same time.

Communicative intention ◦	CDF type ◦	Performative verbs ◦
I tell you how we can cut up the world according to certain ideas ◦	Classify ◦	classify, compare, contrast, match, structure, categorize, subsume ◦
I tell you about the extension of this object of specialist knowledge ◦	Define ◦	define, identify, characterize ◦
I tell you details of what can be seen (also metaphorically) ◦	Describe ◦	describe, explain, label, name, specify ◦
I tell you what my position is vis a vis X ◦	Evaluate ◦	evaluate, judge, argue, justify, take a stance, critique, comment, reflect ◦
I give you reasons for and tell you cause/s of X ◦	Explain ◦	explain, reason, express cause/effect, draw conclusions, deduce ◦
I tell you something that is potential ◦	Explore ◦	explore, hypothesize, speculate, predict, guess, estimate, simulate ◦
I tell you about <u>sth.</u> external to our immediate context on which I have a legitimate knowledge claim ◦	Report ◦	report, inform, recount, narrate, present, summarize, relate ◦

Table 2. CDF construct (Dalton-Puffer, 2013)

Also, it should be noticed that these seven types of individual operations are co-dependent and interrelated. Additionally, every CDF type does not stipulate which linguistic verb students have to perform. The CDF construct has been empirically validated for different subjects in previous studies. For instance, the research in Austrian CLIL lessons (Dalton-Puffer et al., 2018) indicates that the CDF construct does occur in naturalistic CLIL classroom interaction across a range of subjects including social and natural science lessons as well as English as a Foreign Language lessons. Morton (2020) also argues that CDFs can be used as “building blocks” to build the bridge between cognition and language or thinking, speaking or writing.

In CLIL classroom, language and content are considered equivalently significant, which should not be delegated to the sole responsibility of language teacher or subject teacher. Accordingly, the integration that linking up language and content seems to represent a crucial issue, while communication and educational contexts could assist conception of concept (Hymes, 1972). In addition, in terms of pedagogy, preparing learners for their future is the aim of education; thus, it is essential to access and negotiate knowledge. As a result, to bridge the gap between language and content, cognitive discourse function (CDF) serves as the convergence of the curricular goals of the second language or foreign language education and subject-specific education.

Considering the notion of academic language, Dalton-Puffer (2013) states that it is the intertextual nature of language in educational contexts and the interdependence between

written and spoken language in the classroom. These discipline-specific discursive languages are visible in students' writing and use them as building blocks to develop their literacy (writing) skills. As a result, there is a need to look for convergences between the literacy and the specific text types (both oral and written) of communication (Morton, 2020), or so-called academic language, the language used to express knowledge and thinking in the classroom, with the regard of the context of use.

Research Gap and the Niche of This Study

Previous studies on CDF mainly focus on “verbalization” and show how cognitive processes could be linked to verbalization. However, this study aims to fill the gap by examining not just verbalization but the “multimodality and language” that teachers apply and share with the students in class. The interactive use of multimodality and language plays an important role for the bilingual classroom, especially during the increase of virtual learning due to the pandemic. As Dalton-Puffer claims, the goal of CDF is to serve as a “heuristic, operationalizability, interdisciplinary communication between educational linguists and subject teachers”, this study believes it is important to include “multimodality” combined with verbalization as part of the analysis if meaning making process consisting of knowledge construction and knowledge communication are important to reach the cognitive goals of deeper learning in the CLIL classroom. Therefore, this study aims to collect and analyze the multimodal aspects of bilingual resources to explore how the interactive use of language and multimodality could enable the bilingual teachers to achieve CDF more effectively in CLIL classroom.

Aims of the Study

This study extends from the previous study on CLIL science in Taiwan elementary school (Chen & Lin, 2021) based on Cognitive Discourse Function construct as the model and further investigates the bilingual resources to find answers to the questions of what and how and to what extent CDFs occur in our elementary bilingual classroom in Taiwan. Extended from the CDF construct, the research questions raised in this study are listed as follows.

1. What is the general pattern and distribution of CDF applied in the bilingual resources in Taiwan elementary school?
2. What type of language and multimodality are often used to achieve specific CDF function(s), make learning visible, and reach the education goals effectively in bilingual classrooms?
3. Could it be possible that not only a single CDF function but also multiple CDF functions could be achieved through the teaching task?

With the emphasis on the interactive usage of language and multimodality, this study hopes to demonstrate how CDFs could be achieved as a useful link to efficiently connect and integrate language and content in bilingual classrooms, hoping to contribute to teachers and students to help them achieve their teaching and learning goals, develop cognitive skills for shared goals, and to cooperate with each other through multimodal conceptualization, interaction, and engagement in bilingual classrooms. By providing a cognitive function-based CDF analysis, this study hopes to shed light on the significance of interactive use of language and multimodality and raise the awareness of CDF, which could also contribute to the

effective process of course planning and teaching preparation for bilingual teachers in Taiwan elementary schools.

Method

By exploring and analyzing the usage of language and multimodality in bilingual resources, we hope to provide an account of the general pattern of the interactive usage of language and multimodality in educational context and how it can achieve specific cognitive discourse function. Data collection and research procedures would be introduced as follows.

Data Collection

The multimodal data analyzed in this study are collected from the teaching resource for bilingual lessons, including the subjects of Science and Integrative Activities, in Taiwan elementary school. In this study, the data is collected from the following categories:

1. Teaching resources: textbooks, teaching guides, teaching slides for instruction
2. Students' work: activity sheet, in-class activities, online assignment, show and tell group presentation, posters, etc.

Data Analysis

The data analysis is conducted with the following research procedures:

(1) **Language:** the use of performative verbs, sentence patterns, and keywords in academic language would be identified and analyzed based on its communicative intention and the CDF construct. Chinese and English will both be analyzed to see the general pattern and frequency of language use in bilingual classrooms.

(2) **Multimodality:** the use of multimodal teaching resources, including music, video, and hands-on activities, etc. is one of the main teaching strategies for bilingual classrooms in Taiwan elementary schools. In this step, we will investigate how multimodal teaching resources are incorporated with academic language to achieve the Cognitive Discourse Function(s) through different modes. The purpose is to see how language is combined with multimodality in an elementary educational context to achieve CDF and to help students comprehend and follow the instructions well.

(3) **Practice evaluation:** the language and multimodality analysis will be further evaluated with teachers during classroom observations, course evaluation interviews, and teacher's training workshops to discuss with teachers in practice and collect their opinions for detailed analysis to explain how and why specific CDFs are used and what goals are reached through the interactive use of language and multimodality.

Conclusions

Main Findings

In general, "classify, describe, and define" seem to be the most frequently occurring CDFs in our data. However, "explore and explain" are more emphasized in specific subjects like Science, while "evaluate and report" are more frequently found in Integrative Activities. This indicates that the bilingual teachers and students are achieving the CDF altogether effectively

through language and multimodality with different focus in specific subject based on the curriculum guidelines and the learning focus of the lessons. The pattern, distribution, and frequency of CDF are closely related to the content, the level, the fundamental belief and educational goals of specific subject.

To achieve CDF effectively, the performative verbs are not necessarily used in the instructions, instead, the bilingual teachers often convey the key concept through simple sentence structures, such as WH-questions and level-appropriate vocabulary while giving instructions, to achieve the cognitive discourse function and educational goals for better comprehension and classroom interaction. In addition, multimodality is often used interactively as the supporting resource to help students comprehend, scaffold the key concept, and reinforce through visual and aural modes, hands-on activities, and connection with daily life. Our discussion with local teachers and foreign teachers from bilingual classrooms also indicates that it is necessary for the teachers to simplify, design, and adjust their language and use the nouns, adjectives, and verbs that are suitable for their elementary school students based on the students' language proficiency level and the appropriate curriculum guidelines of English for each grade.

Multiple CDF functions could be achieved through integrative tasks designed for higher graders as there are more than one-on-one mapping relationships between the CDF and the language of/for learning (input) and language through learning (output), there may be more than one-on-one mapping relationships between the CDF, for example, the "more-than-one CDF integration" like "evaluate" and "explain" CDFs are sometimes achieved simultaneously by the teachers, "report", "explain", and "explore" could also be achieved altogether through the interactive use of language and multimodality in the teaching materials and classroom activities that require higher order cognitive skills. For further studies, more data and analysis need to be conducted to explain when and how such CDF integration plays a role and how it can benefit teaching and learning in bilingual classrooms in Taiwan elementary schools.

Implications and Future Research

This study aims to provide a usage-based account for the Cognitive Discourse Function and multimodal conceptualization in the bilingual educational context of Taiwan elementary schools. With the emphasis on the interactive usage of language and multimodality, this study hopes to demonstrate how cognitive discourse functions could be achieved as a useful link to efficiently connect and integrate language and content in bilingual classrooms, aiming to contribute to teachers and students to help them achieve the teaching and learning goals, develop cognitive skills for shared goals, and to cooperate with each other through multimodal conceptualization, interaction, and engagement in bilingual classrooms. Therefore, this study hopes to shed light on the significance of interactive use of language and multimodality and the awareness of CDF, which could contribute to the effective process of course planning and teaching preparation for bilingual teachers.

For further studies, we believe CDFs could be applied differently through language and multimodality based on different subjects, cognitive skills, and language proficiency level in bilingual classrooms. More data and analysis need to be conducted to discover the general pattern of CDF usage and provide an indexical account in a specific subject and explains how it can help the teachers and students to achieve the CDF and educational goals effectively and facilitate classroom interaction and engagement.

References

- Breeze, R., & Dafouz, E. (2017). Constructing complex Cognitive Discourse Functions in higher education: An exploratory study of exam answers in Spanish- and English-medium instruction settings. *System*, 70, 81-91.
- Chen W. J., & Lin, T.Y.Y. (2021). Cognitive Discourse Functions and Multimodality in CLIL Science. International Conference on Bilingual Education.
- Coyle, D., Hood, P., & Marsh, D. (2010). *Content and Language Integrated Learning*. Cambridge University Press.
- Coyle, D., & Meyer, O. (2021). *Beyond CLIL: Pluriliteracies Teaching for Deeper Learning*. Cambridge University Press. <https://doi.org/10.1017/9781108914505>
- Dalton-Puffer, C. (2013). A construct of cognitive discourse functions for conceptualizing content-language integration in CLIL and multilingual education. *European Journal of Applied Linguistics*, 1(2), 1-38.
- Dalton-Puffer, C., Bauer-Marschallinger, S., Brückl-Mackey, K., Hofmann, V., Hopf, J., Kröss, L., & Lechner, L. (2018). Cognitive discourse functions in Austrian CLIL lessons: towards an empirical validation of the CDF Construct. *European Journal of Applied Linguistics*, 6(1), 5-29.
- Evnitskaya, N. & Dalton-Puffer, C. (2020). Cognitive discourse functions in CLIL classrooms: eliciting and analysing students' oral categorizations in science and history, *International Journal of Bilingual Education and Bilingualism*, DOI:10.1080/13670050.2020.1804824
- Hymes, Dell (1972). On communicative competence. In J.B. Pride and J. Holmes (eds.), *Sociolinguistics: Selected readings*, 269–293. Harmondsworth: Penguin.
- Lin, T.Y.Y. (2018). Multimodal conceptualization in Children Music: viewing from “Music Together”. Presented at *Metaphor Festival* International Conference from August 30, 2018. to September 1, 2018., at University of Amsterdam, Netherlands.
- Lin, T.Y.Y. & Chiang W.Y. (2015). Multimodal fusion in analyzing political cartoons: Debates on U.S. beef imports into Taiwan. *Metaphor and Symbol*, 30 (2), 137-161.
- Lin, T.Y.Y. & Chiang, W.Y. (2016). Concrete Images and Abstract Metaphorical Extensions in the Encounter between Language and Music: Hsu Chih-Mo's poem “Serendipity”. *Journal of Pragmatics*, 96, pp. 32-38.
- Morton, T. (2020). Cognitive Discourse Functions: A Bridge between Content, Literacy and Language for Teaching and Assessment in CLIL. *CLIL Journal of Innovation and Research in Plurilingual and Pluricultural Education*, 3(1), 7-17.