

## A CASE STUDY OF INSTRUCTIONAL LANGUAGE AS A MEDIATIONAL TOOL

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### Abstract

Based on a brief review of the related theories upon how language as a mediational tool functions in promoting learners cognitive ability ,this paper presents a case study of the virtual interaction involving instructional language to show how teachers use language as a tool to promote learners cognitive development . Results demonstrate considerable significance of virtual instructional language as a mediational tool in learners cognitive development . In addition ,through analysis ,the writers discovered that the subject also made much progress in his linguistic development ,as we expected ,which sheds much light on the role of mediational language in language learning .

### Key words

language ;mediational tool ;cognitive development

### 1. Introduction

It is commonly acknowledged that language plays an important part in human development . How important ,however ,is language in human cognitive development ?And what kind of roles does language play in human mental processing ?These two difficult questions were left unanswered till the early period of the 1930 s ,when Vygotsky s Thought and Language was published . He bridged the gap between tool use and human cognitive development by defining cultural signs and symbols as psychological tools ,and proposed that human higher mental processes are mediated in social cultural settings by those tools . Language ,the unique human behavior ,is regarded as the most important one of these tools . The importance of these psychological tools is that they bring about the transformation of human consciousness and are the instruments essential to the development of higher cognitive functions ,such as intentional memory ,planning ,voluntary attention ,etc . ( Vygotsky 1931 /1997b ) .

“ A social mode of thinking ” ,a phrase coined by Neil Mercer ( Mercer 1995 2 ) when talking about the role of languaging ,gives a precise and accurate suggestion of the integration of two functions of language . For him ,the two functions of language ,cultural function ( communicating ) and psychological function ( thinking ) ,are not really separate . Language is a means of transforming experience into cultural knowledge and understanding . It is language that directs and mediates people s mind in the process of thinking and communicating ( Mercer 1995 ) .

As for language learning ,Vygotsky s Soviet contemporary ,Bakhtin ( 1986 ) held the view that teachers promote learners language learning by using mediational language as linguistic interaction ,in which learners learn through incorporating the language of others or responding to others reactions .

Focusing on this aspect, a number of foreign researchers have conducted different studies under a certain context, in which teachers or other significant people mediate in learners' language learning process, especially children's language development (see Hasan 2002; Lantolf 2000; Mercer 1995; etc.). The main target of their observation was face-to-face interaction. To elaborate on the point from a different perspective, the writers make a simple analysis of a case involving an electronic linguistic interaction between two teachers and a college student, which took place in a virtual environment.

What follows in the paper seeks to first explore the Vygotskian theory as to how language functions as a mediational tool in human cognitive development, and second, empirically analyze extracts from a virtual dialogic environment, a message board in an English learning website and testify to the impact of instructional language on the learner's cognitive development in the Computer-mediated Communication (CMC) setting. As a "byproduct" of the analysis, the study also shows how the learner's linguistic level has been enhanced through language during the virtual communication.

## 2. Theoretical framework: Language as a mediational tool in cognitive development

### 2.1 Vygotsky's view of cognitive development

As commonly accepted, cognitive development is the construction of thought processes, including remembering, problem solving, and decision-making, from childhood through adolescence to adulthood. Vygotsky (1931/1966) described two branches of cognitive development. One involves mastering the symbol systems of the culture and the other involves developing the cultural forms of reasoning. Besides, he detailed the outcomes of cognitive development as including categorical perception, conceptual thinking (verbal and mathematical), logical memory (memory based on connections and relations among concepts), and voluntary (self-organized) attention.

The central concept in Vygotsky's cognitive psychology is mediation, which states that all human activity is mediated by tools or signs (Vygotsky 1981b; Wertsch 1991). For Vygotsky (1981b), the incorporation of tools or mediational means does not simply facilitate action that could have occurred without them, but rather, by being included in the process of behavior, alters the entire flow and structure of mental functions. The most important of these tools is symbolic language. The use of mediational language to help learners move into and through their Zone of Proximal Development (ZPD)—the distance between the level of actual development and the more advanced level of potential development that comes into existence in interaction between more and less capable participants (Vygotsky 1978) is of particular significance.

### 2.2 Vygotsky's view of instructional language in learners' cognitive development

As a mediational tool, teachers' instructions play a crucial role in promoting learners' development. It is mainly through language, the dominant form of instructions, that teachers assist their learners in solving problems or achieving their goals. In other words, teachers' instructional language is functioning in the role of guiding the learners' construction of knowledge in their development. Nevertheless, not all categories of teachers' instructions are worth the title of "guide" in learners' cognitive development. Vygotsky maintained that to be useful, instruction must move ahead of development and lead it (Vygotsky 1934/1962). To succeed in this role, instruction should focus on problems that the student can solve "in collaboration with or under the guidance of a teacher" (Gredler 2004). That is, instructional language functions best to empower learners when it is provided in their ZPD.

Vygotsky once proposed two points: 1) learning with assistance or instruction is a normal, common and important feature of human mental development; 2) the limits of a person's learning or problem-solving ability can be expanded if another person provides the right kind of cognitive support (cited from Mercer 1995). Apparently, instructional language takes the role of an assistant in moving learners into and through their ZPD, or, what learners achieve with instructional language from significant others is in effect "assisted performance" (Mercer 1995). Although the term collaboration was also stressed by Vygotsky in school setting, it mainly refers to collaboration between teacher & student (Gredler & Shields 2004).

### 2.3 Mercer's view of language as a social mode of thinking

In addition to Vygotsky's theory that language has a strong influence on the structure of thought, Mercer's theory of how talk is used to guide the construction of knowledge contributes significantly to the present topic from a different aspect.

Mercer described language as a social mode of thinking in two important ways: 1) Language is a vital means by which we represent our own thoughts to ourselves, which agrees with Vygotsky's view of language as a psychological tool in human's mental processing; 2) Language is also our essential cultural tool — we use it to share experience and so to collectively, jointly, make sense of it. More specifically, Mercer took language as a tool for teaching and learning, constructing knowledge, creating joint understanding and tackling problems collaboratively. What he highlighted is the social function of language for “collective thinking” rather than “assisted thinking”. He also advocated that the process of how language is used to create knowledge and understanding is purposeful, which specifically means that people use language to pursue their interest and goals to get things done, i.e. people use talk to create knowledge as a joint, social profession. His theory also deals with the fact that one of the interest or goals that someone may be pursuing is, quite self-consciously, to help someone else to learn (Mercer 1995).

Therefore, language is not just a means by which individuals can formulate ideas and communicate them. It is also a means for people to think and learn together (Mercer 1995). To sum up, what learners achieve in social settings where significant others are involved, according to Mercer, is actually a “joint achievement”.

Thus, though Mercer's view upon the relationship between language and thought originates from Vygotskian theory, it does have a different emphasis from it. Whereas Vygotsky focuses on the assisted-thinking function of language, Mercer weighs more on its collective thinking effect. The subtle distinction between the two versions is substantiated in the following analysis.

## 3. Methodology

### 3.1 Research context (the case)

The research context is an English Writing Forum on a university's website. There is a section named Online Communication where teachers and students can exchange their ideas on writing or else. The managers of the section are two English writing teachers responsible for keeping this forum in good order and answering students' questions. A non-English major called Paul who was a junior and often visited the web captured the writers' attention for his frequent visit and obvious improvement in English, although he had ceased his classroom college English learning.

The electronic linguistic interaction between Paul and the managers defines the case in the study. The following part demonstrates several typical fragments of natural and spontaneous cultural activities to present and analyze how teachers used language as a tool to promote the learner in the virtual environment, or how the online conversation between them extended the intellectual potential of the individual learner. In addition, some important figures were drawn from the former and later parts of Paul's posting collection, with the aim of finding some significant difference between his English levels over the time span by a contrastive study.

### 3.2 Instruments

#### 3.2.1 Instruments for qualitative analysis

In this sense, the research can be classified as *ex post facto* and longitudinal case study, conducted with both qualitative and quantitative methods. The qualitative analysis of the interaction was focused on Vygotsky's second branch of cognitive development, i.e. developing the cultural forms of reasoning. Several instruments were adopted to elaborate the learner's cognitive development from the following different perspectives. Ruqaiya Hasan's (2002) classification of mediation is efficient for illustrating how the learner extended his intellectual potential in different cultural settings where diverse language-dominated mediation was involved. There are good reasons for attending to the differences between his two modes of the operation of semiotic mediation, one mode that creates the “habits of the mind” — a

sense of relevance which is active in the social subjects of actions and/or negotiations, furnishing motivations for engaging in them or not — and another that leads to the appropriation of the elements and structures of specialized knowledge. He refers to these two manifestations of semiotic mediation as invisible and visible mediation, respectively.

In addition to Hasan's (2002) classification of mediation, the different functions of the fore-mentioned assisted and collective learning in promoting the learner were analyzed.

Benjamin Bloom's (1956) broadly accepted taxonomy of intellectual behavior in learning, which shares much with Vygotsky's identification of the outcomes of cognitive development, was applied to judge the improvement of the learner's thinking ability. His cognitive domain was manifested in different ways: knowledge, comprehension, application, analysis, synthesis and evaluation. On the knowledge level, learners are supposed to be able to collect knowledge about a particular problem, or know the five Ws of it; on the comprehension level, learners can be capable enough to understand and then retell a problem. These two levels of cognitive abilities lay basis for the other four. In other words, on the basis of the two, learners on the application level are assumed to modify something and then apply it in new setting, on the analysis level, to be able to separate components of a whole and distinguish between facts and inferences. On the contrary, learners on the synthesis level are supposed to have the ability to create a new meaning or structure by parting parts together to form a whole. The highest level of cognitive abilities learners can achieve according to Bloom is evaluation. On this level, learners can make judgments about the value of ideas or material. Apparently, Bloom's hierarchical order of these cognitive abilities accords with the development trail of human cognition.

To overcome the possible chaos brought about by the analysis with these instruments, the writers employed a simple componential analysis.

### 3.2.2 Instruments for quantitative analysis

The quantitative analysis, supposed to discover how the learner's linguistic level had been improved with the help of instructional language, was conducted around Vygotsky's first branch of cognitive development, i.e. mastering the symbol systems of the culture. Language, the mediational tool in this case, itself developed as the subject's reasoning abilities progressed. Contrastive statistics was composed upon the subject's postings in the former and later period in two aspects, namely, the numbers of errors and of simple and complex sentences of the two periods. Classification of the errors was based on previous taxonomies established by researchers such as Corder (1974), Ferris (2002), James (1998) and Richards (1994). The following categories of errors were identified: grammatical errors (prepositions, agreement and predicate verb, articles, pronouns, use of negative, conjunction, use of infinite verb); lexical errors (word choice, inappropriate vocabulary); and syntactic errors.

The identification of sentences was done on the basis of Zhang's (2000) grammatical criteria. He sub-divided full sentence into four, namely, simple sentence, compound sentence, complex sentence, and compound complex sentence. In the present statistics, the writers modified the division slightly into two: simple sentence, and complex sentence which includes the later three.

### 3.3 Data Collection and Treatment

Totally, Paul's available posting collection consists of 7777 words, scattered over 16 months from April, 2003 to August, 2004. It could be categorized into three groups in accordance with how the learner was involved in the online interaction: asking questions, providing answers, and making argumentations. One typical extract was selected from each of them to do some qualitative treatment with relevant instruments. Quantitative analysis was done by conducting a contrastive study of the subject's English proficiency in the former and later periods of the time span. The authors divided the collection into five parts, and took the first and last 20% or so of the data for statistical analysis, 1581 and 1601 words respectively. (For certain, they are of slightly different length, for the sake of sentences completeness). The statistics was composed in two aspects, namely, the numbers of errors and of simple and complex sentences of the two periods by referring to Corder (1974) et al's taxonomies and Zhang's (2000) grammatical criteria, respectively.

#### 4 . A case study :Analyzing instructional language as a mediational tool

##### 4 .1 A qualitative analysis of the interaction process

Extract 1 :

Paul :( April 3rd ,2003 )

Professor Liu ,I am so glad to see your homepage . I had your class several times ,and I think your class is very good . Now I like English very much ,I'd like to get some suggestions about English study . My vocabulary is big ,but I can't use them well . I am a student of non -English major . I mean I can recognize them ,but in writing ,I don't know how to use better .

Tutor :( April 4th ,2003 )

Paul ,Thanks . What you said about your problem in your English study is a common one for English learners . The only way for you to improve your communicative ability is to use the language input often through retelling ,speaking ,writing as well as reading a lot . Learning language is a complete process from getting input to understanding and memorizing the input to producing the output . But most learners finish the learning process half -way . They stop learning when they think they have memorized the language or even just understood the language ,say ,the text . If you go on practicing by using the language ,you can retrieve the language more easily when you want to use them . Ok ,I hope what I said can help a little .

Paul :( April 4th ,2003 )

Thank you for your help about my confusions , professor Liu . You mean though I don't have English classes now ,I must find some chances to use English . Maybe I should get a foreign pen pal or friend to speak in English . I know what I should do ,thanks again ,Fighting !(a happy face )

In this extract ,it is the first time Paul happened to find the Online Communication section in the English Writing Center ,and he showed his great interest in it by consulting one of the tutors about his English learning problems . Judging from his awareness of his problems in learning English and positive attitude towards searching for solutions to overcome them ,it can be inferred that he was a promising English lover ,which contributed greatly to his improvement . However ,more importantly ,it was the tutor who directed him in the process of solving his problems . That is ,the tutor did a lot by using language which could be called "scaffolding "to lead or guide Paul through his English learning .

Theoretically speaking , language is a means for transforming experience into cultural (communicating) knowledge and understanding ( Mercer 1995 ). It is mainly through the medium of spoken and written language that learners benefit from the knowledge or experience of teachers . In practice ,the most commonly used way for a teacher to mediate his learners learning process is to tell them what to do ,how and when to do it directly . Paul asked for the tutor's help and for certain ,the tutor would organize her thoughts in accordance with her years of teaching experience and share what she had possessed concerning the problem with the learner by telling him what in particular he should do . In such setting ,what Paul got from the virtual interaction is assisted achievements . Just like a stranger who lost his way in a big city ,when he asked a policeman for help ,the policeman ,who played a role as significant others for the stranger under such circumstance ,would tell him how to get to his target place by verbal means or even draw a simple map for him . Then what is needed next is the stranger's efforts to pursue his goal by consulting what he has got from the policeman . Apparently ,what the policeman told the stranger or provided on the map was a mediational tool to guide him to find his way in the city . Therefore ,it is easy to recognize the importance of such a tool when someone is trapped in troubles .

As for this kind of tool using mediation ,Hasan may state it more professionally :visible and invisible mediation ( Hasan 2002 ) . As the label suggests ,visible mediation is deliberate and relatively more clearly focused on some specific concept or problem . Interactants can actually see what they are doing :one of the interactants is aware that he is teaching or explaining something specific to someone ;further ,an essential requirement for success in learning is voluntary attention and active participation on the part of the learner . In this way both interactants have a fairly clear sense of the goal to be achieved ( Hasan 2002 ) . Apparently ,the extract above can be well elaborated by this proposition ,in that the tutor's

instructions are actually visible semiotic mediation in the learner's development.

Furthermore, Bloom's cognitive domain should be adopted to probe into the learner's cognitive development. He identified six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom 1956). In Extract 1, Paul has attained two levels of those cognitive abilities under the tutor's visible mediation, namely, knowledge and application. To put it in detail, he surely has some ideas about the 5 Ws of English learning, which means he has achieved the knowledge level; after absorbing the tutor's suggestions, he knows how to solve his problems by applying the advice, which indicates that he has gained the application ability.

Extract 2 :

When Paul said that he would have a chance to interview a black lady, the other tutor asked :

Tutor :(October 26th, 2003)

Hi, Paul. Could you please ask about her opinion about a novel entitled *The Color Purple* by Alice Walker? Many thanks.

Paul :(October 26th, 2003)

Ms Zhao, this afternoon I finished the interview to the black lady with flying colors. Anyway, I will e-mail her to ask her what her opinion about *The Color Purple* by Alice Walker is. Anyone who has questions about black people, it's my pleasure to explain them to you.

The normal reaction to such a dialogue is that nothing is happening that could be considered significant from the point of view of mental activity. But that is not the case. Although different from the straightforward instruction in Extract 1, the indirect way to mediate learner's learning by questioning in this extract is of equal significance to the learner's cognitive development. According to Hasan, in interaction where invisible semiotic mediation occurs, as in this extract, interactants are aware neither of the teaching nor the learning of any concept in particular, much less of any specific goal to be achieved, or, at least, the goal uppermost in the mind is not directly relevant to what language is mediating. The interactants do not "see" what is being mediated; what they "see" is some process of everyday living (Hasan, 2002). Applied to this situation, it implies that the learner Paul could obtain something valuable invisibly.

In another place, when invisible scaffolding is involved in language-mediated cultural activities, what a learner achieves is usually collective performance, no matter who his mediator is, a teacher or a peer. The reason is that in such settings, a learner can become actively involved in others' learning activity, progress further and more easily than they could have done alone, and eventually achieve his or her joint performance.

In this case, assigned the task, Paul, whether he took it as a challenge or not, was to some extent responsible for getting the black lady's opinions upon the novel. Suppose Paul had no idea about this novel before, in order to be qualified to raise the question to the interviewee, he had to read it or search for something about it, and he also needed to try to come up with some ideas of his own. That means Paul has improved his knowledge ability by collecting and reading something fresh for him. Even if he had read through the novel, he still needed to do some further thinking so as to exchange his thoughts with the interviewee. Hasan says discussing is a way to enhance comprehension level (Hasan, 2002). Therefore, Paul's comprehension ability will be definitely enhanced. In addition, rather than the tutor who proposed the query to Paul, Paul would be the first listener to the black lady about her opinions in *The Color Purple*. After recording what she said, Paul had to output what he had absorbed to the tutor. Generally, it is through the process from input to output that a person's thinking ability is developed.

Extract 3 :

When one of the tutors stated on the web that structure was important in English writing :

Paul :(October 8th, 2003)

Hi, Ms Zhao. Glad to meet you here! About writing, I have different ideas than yours! Your opinion seems like some of teachers who taught me English or Chinese, most of whom think that structure is very important just like skeletons of my body! But I think, more importantly, content

lies in the first place !... If students pay much attention to the structure ,I doubt whether or not they can really write well that they really want to express !...

Tutor :(October 8th ,2003 )

Hi ,Paul . Very glad to have ur opinions about writing . Thanks for ur response . I did say structure is quite important in writing ( English writing ) . But I m afraid u have misunderstood something or I have not stated something clearly ... And I bet u know what troubles the Chinese students most . To be frank ,I do not think content is the key that blocks their writing . ... I think most of us know and can talk a lot about the topic we are going to write about . It is just the language we are using prevents us from effective expressing . If we can get over this ,u can find our English writing become excellent in content .

And ,as regards the importance of structure ,I do not mean there is a priority of structure over content

Paul :(October 8th ,2003 )

Hi ,thank you for your quick reply ,Ms Zhao ! I agree you mostly ,I am sure whether or not I am right about writing ,but what I often do is to write down what inspires me sometimes ,and also I often read some other s essays to absorb good things I think . Surely ,I read some good articles that were written by students of English major ! What gave me deep impression is that some students can describe exactly activity in their minds ,which I can t . ...

This is an online disputational talk , which is characterized by disagreement and individualized decision making ( Mercer 1995 ) . In spite of his grammatical mistakes in expressing his opinions , Paul managed to get himself understood during the discussion . Concerning the function of the tutor s involvement in such kind of argument and the role it plays in transforming or constructing learner s mental thinking , many experimental researches have been conducted to testify to the statement that discussion among children is beneficial to their intellectual development . Mercer also drew a conclusion that talk between learners had been shown to be valuable for the construction of knowledge , since discussion provides opportunities for practicing and developing ways of reasoning with language ( Mercer 1995 ) .

People in discussion always assert their own agendas and represent their own interests . However , on the other hand , they usually attempt to establish shared agendas and perspectives and pursue joint agenda interests ( Mercer 1995 ) . This point is clearly seen in the above extract . Firstly , the learner endeavored to convey his different ideas from the tutor upon English writing , and seemingly tried to persuade others to accept his . After absorbing the tutor s reply , he began to learn to agree and merge their opinions together . In the end , he regarded his argument as a sharing of opinion with the tutor . But in actuality , it is not a simple sharing . Knowledge can be created out of the conflict of ideas as much as through the accumulation and combination of them ( Mercer 1995 ) . From this point of view , his synthesis cognitive level is facilitated through combination and most apparently , his evaluation level including assessing ability , decision-making ability , persuading ability , defending ability , etc . is strengthened firmly . All these cognitive achievements are reached through this casual talk where invisible mediation occurs , and through collective thinking activity . In the days that follow , Paul surely would pay more attention to structure than before . That s the aim of teacher s mediation by using language in learner s thinking and learning , though it is achieved unconsciously and invisibly in this extract .

To clarify the presentation , the writers adopt a componential analysis of the above , as shown in Table 1 :

Table 1 . Componential analysis of the three extracts

Extract	Hasan s ways of mediation	Nature of achievement	Bloom s taxonomy
Extract 1	+ visible	+ assisted	+ knowledge / application
Extract 2	+ invisible	+ collective	+ comprehension / knowledge
Extract 3	+ invisible	+ collective	+ synthesis / evaluation

## 4.2 A quantitative analysis of the subject's linguistic improvement

From the above analysis, the belief that teachers' language does function as a mediational tool in promoting learners' cognitive ability has been established. To our expectations, during the process of analyzing, the writers discovered that apart from his promotion in cognitive ability, Paul has achieved a lot linguistically, which sheds much light on the role of mediational language in language learning. Some useful figures focusing on Paul's linguistic achievements are collected and demonstrated in Table 2 and Table 3.

Table 2. Total number of different errors made in the two periods

Classification of errors	Former 1581	Later 1601
Grammatical errors		
Prepositions	6	4
Agreement and predicate verb	5	4
Articles	6	0
Pronouns	4	3
Use of negative	2	1
Conjunction	5	3
Use of infinite verb	4	2
Lexical errors		
Word choice		
inappropriate vocabulary	8	7
Syntactic errors	13	7
Total	53	31

Table 3. The number of simple and complex sentences in the two periods

Classification of sentences	Former 1581	Later 1601
Simple sentences	42	42
Complex sentences	53	69

On the basis of the statistics above, it is possible to claim conclusively that Paul's English proficiency did stride forward and his way of thinking became more logical during the virtual communication. Undoubtedly, Paul's improvement might be attributed to a number of factors, such as his great interest in English, efficient learning strategies, strong desire to go abroad etc. However, the role of the two tutors' mediational language should not be underestimated. The statements that Paul's language improvement was achieved through language communication with significant others and a tool's quality should always be bettered in the course of being used became more convincing.

## 5. Discussion

According to a sociocultural perspective on L2/FL learning, social interaction is considered an integral process in language learning, and human cognition is formed through social activity. In this view, learning an L2/FL is understood as a semiotic process attributable to participation in social activities rather than internal mental processes solely by the individual (Block 2003; Lantolf & Thorne 2006). Recent studies have shown how learners acquire a language by using that language in social interaction with speakers of that language, however focusing on pair work via CMC rather than teacher-student interaction mainly (Belz 2003; Belz & Kinginger 2002, 2003; Belz & M. Uler-Hartmann 2003; Chung, Graves, Wesche & Barfurth 2005). A researcher from New Zealand, Le Pham Hoai Huong once reviewed the mediational role of language teachers in Sociocultural Theory (SCT) and cited an excerpt between a teacher and several students to illustrate how scaffolding, teacher-student interaction, and student-student interaction operate as assisted performance in language learning. Nevertheless, the review only covers goal-oriented interaction in real dialogic surrounding.

The present study narrows the scope down to the mediational role of instructional language and

empirically testified to the truth that teachers use the mediating tool of language to assist learners and that learners use language to understand and internalize new knowledge. This internalization leads to the individual's cognitive and linguistic development. Teaching in the sociocultural perspective, thus, means assisting and guiding learners to do what they are not able to do alone, recognizing the interdependence of teacher and learner in the co-construction of knowledge, and seeing teachers as mediators in the learning process. The sociocultural approach to L2/FL learning, therefore, calls for broadening the context of social interaction from a classroom setting to a virtual even intercultural communication. In such settings, more real opportunities to use the target language are available to language learners, and language use in real communication becomes a sort of learning resources which promote language development. In another place, teaching in the ZPD has been interpreted as providing guided assistance (scaffolding) and meaningful interaction, that is, teachers provide the assistance necessary to bring learners to a higher level through the zone and to a greater independent capacity. Therefore, the ability of instructional language to mediate learners' cognition will never be over-emphasized and dialogue should be in focus from a sociocultural perspective.

## 6. Conclusion

### 6.1 Summary

Based on a brief review upon how Vygotskian theory is concerned about the role of language as a mediational tool in human cognitive development, the study demonstrated a tentative analysis of an electronic interaction involving instructional language to show how teachers promote the learners' cognitive as well as language development with language. In conclusion, the tutors' prompts, confirmations and queries, defined as manifestations of semiotic mediation, provided the learner a support for his further thinking activity and language learning.

### 6.2 Limitations

Although the study has provided some insights into the role of instructional language in promoting learners' cognitive development, the conclusion should be generalized on a basis of a further experiment and research. The sole subject and the relatively short period of the study indicate that a large-scale investigation is needed to strengthen its reliabilities. In addition, some other individual factors of the subject, such as his English learning motivation, learning strategy, etc., were not controlled or studied, which should have been done in order to testify to the positive function of instructional language in his linguistic development.

### 6.3 Implications

To investigate further, most of the present domestic researches are concerned about the role of instructional language or teachers' role in real teaching environment. There has been little work that focuses on the role of language in CMC as the present research does. Therefore, this review recommends future research into how students learn online with the assistance of teachers in a virtual context rather than a face-to-face setting. Moreover, whether there is any relative value of the two settings, namely face-to-face and virtual, when teachers' mediation in learners' development happens in both of them needs to be investigated. And the contribution of the relative value to the present online teaching and learning is worth future studies. From a sociocultural perspective, whether there is any implication of the relation between language and thought to learners' thinking ability development and to collaborative learning in foreign language teaching is of great research significance. Anyhow, the range of questions to be explored is immense, and both teachers and researchers should take them into account.

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