



## Behavioral patterns of knowledge construction in online cooperative translation activities



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### ABSTRACT

This study investigated the behavioral patterns of students' knowledge construction in online cooperative translation activities. Forty-eight college students participated in the study. Methods of lag sequential analysis and frequency analysis were adopted. Results showed that 1) all behavior stayed within the medium level of knowledge construction, and from which four significant behavioral sequences were identified; 2) distinctions existed between higher- and lower-engagement students with respect to behavioral patterns; and 3) the behaviors of negotiation and knowledge co-construction occurred more frequently and continually in the higher-engagement group. In addition, this study also revealed certain limitations of students' knowledge construction behavior in online cooperative translation environments without teacher guidance, specifically the exorbitant social-emotional interaction and the inactive engagement of some students.

### 1. Introduction

With the advancement of globalization, college graduates with specialized English competencies are in urgent need in China. To cultivate more talented individuals who can process and use information in English related to their major fields of study, universities in China have established a specialized English course as a basic required course for most majors (Ding, 2012; Zhang & Li, 2010). Specialized English translation instruction (SETI) occupies an important position in China's overall educational curriculum (Yang, Guo, & Yu, 2016). SETI aims to cultivate student competencies in translating content from particular professional fields, such as chemistry, biology, and business administration.

Currently in Chinese universities, SETI still follows the traditional 'grammar-translation' method, in which teachers play a central role while students receive knowledge passively. Instructors often spend much time teaching specialized English translation knowledge and skills (Ma, 2011). However, the effectiveness of SETI is now being questioned by increasing numbers of teachers and experts, because university students seem both less interested and less confident in their subject of specialization (Liang & Li, 2011; Sun & Bai, 2011).

In recent years, cooperative learning (Gillies & Ashman, 2013; Slavin, 1980) has become increasingly popular. Cooperative learning has been found to be beneficial for the improvement of learner achievements, attitudes, and motivation (Nam & Zellner, 2011; Aydin, 2011; Zraa et al., 2013). Therefore, many language-teaching

researchers have begun to study how to use cooperative learning methods to improve second language learning outcomes (AbuSeileek, 2007; AbuSeileek, 2012; Chang & Hsu, 2011; Kargar, Sadighi, & Ahmadi, 2012; Pan & Wu, 2013; Zahedi, 2012). Furthermore, with the proliferation of information technology, computer-assisted cooperative language learning (CACLL) has also emerged as a new trend. Nevertheless, current CACLL research mainly focuses on reading (Lin, Chen, Yang, Xie, & Lin, 2014; Yaghoobi & Razmjoo, 2016; Yang, Yu, & Sun, 2013) and writing (Kessler, Bikowski, & Boggs, 2012; Li & Kim, 2016; Strobl, 2014). The topic of how to better use technologies to facilitate specialized English cooperative translation instruction deserves our attention.

Because studies related to specialized English cooperative translation instruction remain rare, this study aims to explore online cooperative translation activity based on the Learning Cell System (LCS) (Yu, Yang, Cheng, & Wang, 2015), an open learning platform. Cooperative translation is a process of social knowledge construction in which students construct specialized English knowledge through various types of interaction, including commenting, discussing, and information sharing. To some degree, interaction times represent the engagement levels of students. Currently, many studies have confirmed the positive impact of behavioral engagement on students' online learning performance (Arbaugh, 2000; Michinov, Brunot, Le Bohec, Juhel, & Delaval, 2011; Zhao & Kuh, 2004). One efficient way to measure student engagement is counting the frequencies of behaviors (Yang et al., 2016). However, high frequencies of behaviors are not

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necessarily a reason to get good learning result. The behavior patterns hidden behind the behavior frequency might better explain the above argument. Thus, clarifying the distinctions among the behavioral patterns of students with different levels of participation should help explain why higher-engagement students often achieve better learning performance in online learning. Unfortunately, the relationship between students' behavior patterns and their learning engagement has not been identified yet, especially in the context of SETL.

To summarize, the objectives of this study are first, to investigate the behavioral patterns of students' knowledge construction in the course of online cooperative translation, and second, to analyze the distinctions of behavioral pattern among students with different levels of engagement. The two research questions are specified as follows:

1. What kinds of sequential behavioral patterns of knowledge construction exist in the process of online cooperative translation?
2. What are the distinctions between higher- and lower-engagement students with respect to behavioral patterns?

## 2. Literature

### 2.1. Cooperative learning in specialized English translation instruction

Increasing numbers of researchers in the fields of language learning have become interested in cooperative learning in specialized English teaching. Cooperative learning is the instructional use of small groups in which students work together to maximize their own and each other's learning (Johnson & Johnson, 1999). The essential feature of cooperative learning is that the success of one student helps other students to be successful (Slavin, 1987). The five basic elements of cooperation are positive interdependence, individual accountability, promotive interaction, social skills, and group processing (Johnson & Johnson, 1999).

Presently, research in cooperative learning methods in specialized English teaching is mostly concentrated in the areas of reading comprehension, writing, and oral skills. Through group discussion, classroom debate, and exercises, cooperative learning can create a dynamic classroom atmosphere and motivate students (Zhao, 2012). In specialized English writing instruction, Li (2010) developed an interactive method for teaching writing based on cooperative learning theory. After a year-long study, he found that the method could rapidly improve college students' writing skills. Some other studies have also found positive effects of cooperative learning on students' writing performance (Durukan, 2011; Kessler et al., 2012; Lan, Sung, Cheng, & Chang, 2015; Mahmoud, 2014; Stevens, 2003). With respect to relatively more studied area of cooperative reading, most studies have found that cooperative learning could enhance students' English reading comprehension (Asl, Ghassemi, & Madadi, 2014; Liu, 2012; Yang et al., 2013). Pan and Wu's (2013) study revealed that a cooperative reading approach could play an important role in promoting the reading comprehension of medium- and lower-proficiency students. Additionally, cooperative learning has also been found to enhance students' oral skill performance (Zahedi, 2012). Moreover, cooperative learning has been found to create a significantly positive effect on student motivation toward foreign language learning (AbuSeileek, 2007; Law, 2011; Ning & Hornby, 2014; Zhao, 2015).

In addition to the abovementioned areas of reading comprehension, writing, oral skills, and motivation toward foreign language learning, cooperative learning has also been found to be helpful in improving students' specialized English translation performance. Thus far, only a few studies have been conducted on cooperative translation instruction. Kargar et al. (2012) studied the effects of cooperative translation tasks on the apology speech act production of Iranian EFL learners. They found that cooperative translation could result in deeper processing of both pragmalinguistic and sociopragmatic knowledge, leading to more appropriate pragmatic production. Chang and Hsu (2011) used instant

multi-user shared translation annotation technology to promote cooperative learning among EFL learners. Their results showed that students in groups of five did not have significantly better learning outcomes compared with individual students. Therefore, in cooperative learning the number of members in a group should not exceed five; otherwise, it may be difficult to achieve effective results. Meng's (2010) study showed that cooperative learning could significantly improve college students' translation performance as well as their attitudes toward specialized English translation. Additionally, cooperative learning is helpful to enhance students' communication skills and improve classroom teaching atmosphere (Huan, 2015).

In sum, only a few studies on cooperative translation of specialized English have been conducted in online environments (Chang & Hsu, 2011), and most have stressed intra-group cooperation while neglecting inter-group cooperative learning and whole-class cooperation (Yang, Li, Guo, & Li, 2015). Online environments facilitate the sharing of rich resources and are highly interactive. Although studies have shown the positive effects of cooperative translation instruction on students' attitudes toward learning and translation performance (Chang & Hsu, 2011; Kargar et al., 2012; Meng, 2010), the actual behavioral patterns of student interaction as well as the differences of behavioral patterns among students with different engagement levels remains unclear. Further empirical research is needed to answer these questions.

### 2.2. Student engagement in online learning

Engagement refers to the quality of effort students make to perform well and achieve desired outcomes (Richardson & Newby, 2006). There are three types: behavioral engagement, emotional engagement and cognitive engagement (Fredricks, Blumenfeld, & Paris, 2004). Among these three types, behavioral engagement is explicit and easily measured. Most recent studies of online learning engagement have looked at behavioral engagement (Hwang, Huang, & Wu, 2011; Sun & Rueda, 2012).

Because student engagement is important for achieving satisfactory online learning effects, many scholars have studied the influencing factors of online learning engagement. Researchers have found that the use of course tutors (Richardson, Long, & Foster, 2004), the quality of technology (Webster & Hackley, 1997), partner messages (Klautke, 2015), and learning motivation (Bates & Khasawneh, 2007; Dembo, Junge, & Lynch, 2006; Kanuka, 2005) are all positively related to student engagement levels. Sun and Rueda (2012) indicated that students' computer self-efficacy also had a positive impact on engagement in distance learning. In addition to computer self-efficacy, students' degree of self-efficacy with respect to learning tasks has also been found to facilitate behavioral, cognitive, and motivational engagement of learning (Linnenbrink & Pintrich, 2003). Moreover, some researchers have demonstrated that social media services such as Twitter and MSN Messenger could enhance student engagement and learning outcomes (Akbari, Naderi, Simons, & Pilot, 2016; Hwang et al., 2011; Junco, Heiberger, & Loken, 2011; Rutherford, 2010); the reason for this may be that social media has the core characteristics of sharing and interaction (Kaplan & Haenlein, 2010), both of which are helpful for engaging students in online learning activities.

Regarding the effects of student engagement on learning performance, many studies have explored this issue. Researchers found a positive influence of student engagement on learning performance regardless of whether the learning took place in a classroom or an online learning environment (Arbaugh, 2000; Michinov et al., 2011; Wonglorsaichon, Wongwanich, & Wiratchai, 2014; Zhao & Kuh, 2004). However, there are also some different voices in the literature. Davies and Graff's study (2005) revealed that greater online interaction did not lead to significantly higher student performance. In addition, other studies have focused on the pattern of engagement (Herrington, Oliver, & Reeves, 2003), the predictors of engagement (Miller, Ranier, & Corley, 2003), and the measurement of student engagement

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