HybridNTELL MODEL: AN ALTERNATIVE FORMULA TO FOSTER 21ST CENTURY AUTONOMOUS EFL LEARNERS

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Abstract

This paper examines the design and development process of a Hybrid network technology-enhanced language learning (HybridNTELL) model and evaluates its effectiveness. The model is grounded in a Vygotsky-inspired social constructivism approach to foreign language learning. The concepts of Zone of Proximal Development (ZPD) and Mediation underlie the model design framework, generating interactive content-based instruction in a community of practice. The aim of the HybridNTELL model is to foster the EFL learner autonomy required to live and work in a 21st century knowledge-based community. Four dimensions of autonomy were formulated based on literature on social constructivist theory and the current thinking on learner autonomy. The four interactive dimensions were used to inform four different types of task design: reactive-interdependence, reactive-independence, proactive-interdependence and proactive-independence which are the key components of the HybridNTELL model. Two platforms for applying the model in an EFL context are asynchronous online communication on a discussion board and synchronous face-to-face communication in the classroom. The use of two specific platforms complementary creates a hybrid learning environment. To evaluate the model's effectiveness, ninety first year Chulalongkorn University students were recruited in experiment by stratified random sampling method. The students participated in a HybridNTELL environment during a one-semester English foundation course which is compulsory for non-English major students. Findings suggest that the HybridNTELL model yields positive effects on EFL learning autonomy development based on an assessment of the improvement in students' English proficiency, achievement test scores, curriculum-based holistic performance development and objective language development.

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Introduction

In the 21st century, the notion of a societal transformation to a "knowledge-based society" (Drucker 2002) has a profound impact on English as a foreign language (EFL) learning in higher education. Due to the advancement of information and communication technology, the rate of information and knowledge development has accelerated and consequently, the effective lifetime of knowledge is shortening (Tapscott 1997). Existing knowledge is very soon replaced by new discoveries publicized through new widespread electronic media. This limited lifetime of knowledge necessitates the constant updating, expansion, and development of personal expertise. What constitutes an educated person has radically changed. The educated person must have the capacity to continually learn new concepts and modes of operation throughout his or her life. In this information age, language is inevitably a

"major tool for learning and cognitive development" (Vygotsky 1978: 13).

Similarly, Little (2003: 216) predicted that "the new and rapidly expanding information systems are likely to also have a profound effect on the way in which we communicate within and between societies and, by extension, on the range of skills foreign language learners need to develop." More specifically, English language skills attached to technology literacy have become more powerful in international communication and collaboration since the majority of new world knowledge and international communication is in English (www.internetworldstats.com, retrieved May 17, 2007). As a result, there is a dramatically increasing number of EFL learners especially in higher education with an immediate need to develop a working knowledge of English to participate in global communication.

However, in most monolingual countries such as Thailand, Japan, China, and the like, EFL education cannot respond to learners' needs due to many challenges and limitations. First, there is only a limited number of qualified teachers in proportion to the number of learners. Second, most English classes are large and integrated communicative skills practice is relatively difficult. Third, lecture with addition of drill-and-practice is still a widely used method of instruction. This method leaves very limited opportunities for language use as a "social exchange of meanings" (Halliday and Hasan 1985: 11) in large classes with limited contact hours. In addition, English is still considered a foreign language and learned only as a subject for high stakes examinations. Interaction in English is not necessary for daily functioning, and public standards of English proficiency are quite tolerant.

Furthermore, as in many other EFL countries, the way Thai students learn English has been overshadowed by the washback effect of school or university entrance examinations.

The aforementioned limitations create a great challenge for EFL teachers and educators in higher education. Teachers are expected to create a learning environment in which learners have opportunities to use English autonomously to interact with others both within and outside the class, and further develop their communicative competence for real life use. This article proposes a hybrid network technology-enhanced language learning (HybridNTELL) model as an alternative formula for creating an EFL learning environment to foster autonomous learning. First, the theoretical framework for the model design is described. Second, the methodological procedures are explained. Then, results from the model evaluation and interesting findings are discussed.

Literature review

From recent research (Cotterall 1995, Fowler 1997, Little 1997, Wenden 2002, Dam and Legenhausen 1996), it is indisputable that language learning is enhanced when the student has a large measure of control over the goals, content and process of language learning. It has also been found that the best learning results are achieved if learners work with authentic materials used in the context of real-world-based situations or at least simulations and thus are supported by authentic tasks.

Since the learner is considered the key to development, a number of learner-centered approaches have been introduced to EFL education along with content-based and

task-based instruction and a higher level of participation in classes. As well, a cooperative learning approach where "group learning activities are organized so that learning is dependent on the socially structured exchange of information between learners in groups and in which each learner is held accountable for his or her own learning and is motivated to increase the learning of others" has been proposed (Kagen 1992: 8). Accordingly, foreign language instruction goes beyond just providing "comprehensible input" (Krashen 1981: 6); it also creates socially interactive contexts in which learners actively engage in the learning process. Learning is then viewed as processes embedded in cognitive and social contexts (Kinginger 2000).

The new paradigms of EFL learning in the 21st century inform the recent theory of autonomy in language learning, which has changed from the belief in learners' development towards individualization to a development of skills for "collective scaffolding" in cooperative and collaborative learning activities (Donato 1994). Researchers on autonomy have been aware that in order to develop autonomy, learners need to be freed from the direction and control of others. Little (1991: 13) proposed a learner autonomy that takes as its starting point "the learner's perceived needs, his interest and his learning purpose." However, learners who choose, or are forced by circumstances, to study languages in isolation from teachers and other learners, will not necessarily develop autonomy. This belief was one of the most challenging developments in the theory of autonomy in the 1990s and led to the idea that autonomy implies interdependence. Kohonen (1992) has argued the point forcefully that autonomy includes the notion of interdependence, because personal decisions are necessarily made with respect to social and moral norms. Autonomous learners are expected to be responsible for their own conduct in the social context and must be able to cooperate with others and solve conflicts in constructive ways. Collaborative decision-making within co-operative learning groups is a key feature of Kohonen's experiential model for the development of autonomy. Little (1996) also posits that collaboration is essential to the development of autonomy as a psychological capacity. He proposes that the development of a capacity for reflection and analysis, central to the development of learner autonomy, depends on the development of internalization of a capacity to participate fully and critically in social interactions. In a learning context, autonomy is thus an umbrella term covering both "independence" and "interdependence" as opposed to "dependence," which implies excessive reliance on the direction of teachers or teaching materials (Benson 2001). This clear explanation supports the changing scenario of foreign language learning in the 21st century.

Furthermore, several researchers (Jones 1995, Littlewood 1999, Benson and Voller 1997) have investigated whether cultural value systems will allow autonomy to be introduced in EFL in Asian contexts where students have relatively little opportunity, individually or as a group, to identify and set their own learning goals, to be engaged in free interactive-group learning programs and to develop their own repertoire of learning strategies. To create a form of autonomy that will enable teachers to work within cultural constraints in East Asia, Littlewood (1999: 74) proposed a "broader framework (for autonomy) within

which the perceived needs of different kinds of learners—both inside and beyond East Asia—can be accommodated." He placed autonomy in a group context and distinguished between *proactive* autonomy (where learners take charge of their own learning) and *reactive* autonomy (where learners organize their resources autonomously once the direction is given).

In recent research and articles on the aforementioned ideas of the new EFL learning approaches and concepts of EFL learner autonomy, Vygotsky-inspired social constructivist theory is widely discussed due to the influence and support the theory provides. In his work on developmental psychology, Vygotsky assumed that learning begins from the starting point of the child's existing knowledge and experience and develops through social interaction. This assumption was made explicit in Vygotsky's (1978: 86) idea of the *Zone of Proximal Development*, which he defined as "the distance between what learners can achieve by themselves and what they can achieve with assistance from others." The skills that the individual has already mastered constitute his or her actual level. The skills that the individual can perform when assisted by a more capable person or some other means of mediation constitute the potential level. Thus, learned skills provide a basis for the performance of new skills. When these skills in turn become autonomous and stable, a new zone can be created to make possible the acquisition of still further skills.

From a social constructivist perspective, language learning is about the understanding of learners themselves as agents whose conditions of learning affect the learning outcome (Lantolf 2000). The degree of interaction and involvement in the shared activity depends on learners' motives, beliefs, and attitudes, and their investment in the learning situation. Social interaction is more than the action of one person delivering information to another; rather it shapes and constructs learning through collaborative effort and scaffolding in expert and novice interaction (Kinginger 2002). Through socialization, learners use the target language as a cognitive tool to perform and assist each other in a shared activity (Lantolf 2000). Importantly, collaborative scaffolding allows learners to expand their linguistic and cognitive skills to engage in problem-solving situations (e.g., negotiation of meaning and form) and knowledge building (Swain and Lapkin 2000). Donato (1988) found that students who worked collectively on preparing for a role-play task produced learning outcomes for the group and the individual greater than those produced by their more loosely knit counterparts. Storch (2001) also found that in pair work tasks, only those pairs that exhibited a collaborative orientation to their work resulted in co-construction of new knowledge, peer assistance, and the learning of grammatical form and new vocabulary. Ohta (2000) also argues that the nature of the task and the goals of the learners also affect how participants interact with each other. Tasks should expose students to a wide range of structures appropriate to their level in order to make both meaning and form connections (Skehan 1998). In sum, learners' linguistic, cognitive, and affective domains play a significant role in the social constructivist perspective of language learning because they affect the degree and the quality of social interaction.

However, implementing social constructivist concepts in EFL contexts requires instructional methods or tools to help

overcome the limitation of learning in large classes with less interaction, contact hours, and language resources. These limitations persuade some educators nowadays to incorporate network technology involving computer-mediated communication (CMC) and web-based learning to foster a social constructivist EFL learning environment.

The Internet offers an effective means of opening new horizons for foreign language learning and teaching. Computer-mediated communication through both asynchronous exchange (e.g., emails and discussion boards) and synchronous interaction in real time (e.g., chat rooms, and video conferences) affords unique learning conditions for foreign language learners to expand the use of the target language and thus develop their communicative language skills (see, e.g., Abrams 2003, Blake 2000, Lee 2002, Pellettieri 2000). Previous studies have documented a number of benefits that learners have gained by using network technologies (e.g., Darhower 2002, Lee 2002, 2004, Sengupta 2001, Smith 2003, Warschauer 2000). Network-based learning creates a friendly and low-anxiety learning environment that allows "all" rather than "some" students to participate (e.g., Kern 1995, Lee 2002) and encourages affective support among peers to increase students' motivation toward foreign language learning (Lee 2003, Weasenforth, Biesenbach-Lucas, and Meloni 2002). As opposed to the traditional classroom setting in which one finds a teacher-driven approach, CMC promotes greater interaction and reduces teacher talk, while the learners take equal turns participating (e.g., Lee 2004, Sullivan and Pratt 1996). Through network collaboration, learners extend their communicative abilities; they employ a wide range of discourse structures and

modification devices to interact with others (e.g., Kern and Warschauer 2000, Smith 2003, Sotillo 2000, Toyoda and Harrison 2002, Tudini 2003). As the result of negotiated interaction, learners improve their grammatical competence (Lee 2002, Pellettieri 2000) and written and oral communication skills (e.g., Abrams 2003, Blake 2000, Lee 2002, Payne and Whitney 2002).

From the perspective of learning autonomy, the most significant Internet-based activities involve e-mail, on-line discussion and web authoring (Benson 2001). Internet technologies open up opportunities for interaction among learners, between learners and target language users, and between learners and teachers that would otherwise be difficult or impossible to achieve in the classroom. The Internet also appears to facilitate learner control over interaction. Warschauer et al. (1996) cite a number of studies suggesting that the use of CMC tools in language learning leads to more student-initiated interactions, a social dynamic based on student-student collaboration, more student-centered discussion and a shift in authority from teacher to students. Text-manipulation and CMC applications also offer greater opportunities for the development of control over learning content.

Given the above mentioned benefits that Internet technology has afforded social constructivist EFL learning and learner autonomy development, more and more instructional models and guidelines for online language learning have been created. Yet, relatively little attention has been placed on two big issues that are significant to the area of research and implementation. First, relevant literature reviews and meta-analyses by Zhao (2003),

Felix (2005) and Hubbard (2005) all suggested that existing literature on the effectiveness of technology uses in language education is very limited. There is a lack of "systematic, well-designed empirical evaluative studies of the effects of technology used in language education" (Zhao 2003). Felix (2005) concluded from her "Analyzing recent CALL effectiveness research" that a perfect research design for this type of study remains elusive. Second, although researchers are increasingly beginning to understand that there is an intimate relationship between autonomy and effective learning, this relationship has only been explored at the level of theoretical interpretation and explanation and lacks substantial empirical support.

This current project on HybridNTELL model development is grounded in social constructivist theory as the model design and research framework. It aims to provide a well-established theory-driven empirical-based model with the following objectives in the process of the development and evaluation:

1. To design and develop a HybridNTELL model in the context of application based on social constructivist theory as the theoretical framework;

2. To evaluate the effectiveness of the HybridNTELL model based on the social constructivist theoretical framework guiding the model design which is based on four task types ranging over different degrees of autonomy

HybridNTELL model

This alternative "hybrid"[3] learning model provides a flow of instruction where the two modes of interaction: synchronous face-to-face classroom interaction, and asynchronous online interaction are used equally and complementarily as platforms for communication. Learning autonomy is the main goal which guides the organization and development of the model. The crisis often associated with large classes has been turned to a strength, with the aid of the instructional model, designed from the perspective of Vygotsky-inspired social constructivist theory, which emphasizes on learning language through meaning making and collaborating with others.

The HybridNTELL model was created based on two interrelated areas of study on learning: social constructivist theory and foreign language learning autonomy. The two areas of study frame the way network technology-enhanced language learning is put into practice to foster the foreign language learner's development of autonomy.

Social constructivism: mediation in the ZPD

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[3] The term "hybrid" learning environment is widely used in CALL studies (e.g. Chenoweth, Meskill & Anthony 2004, Liu 2003, Scida and Saury 2006, Ushida and Murday 2006) as well as blended learning. The two terms describe courses in which instruction takes place in a traditional classroom setting augmented by network technology-based activities which can replace classroom seat time. Blended learning, however, implies a combination of more than two learning platforms while hybrid implies the use of only two platforms complementarily (CollinsCOBUILD 2006).

The first key construct that offers an overview of the learning process taken into account in the HybridNTELL model is Vygotsky's concept of "mediation" within "the zone of proximal development". As illustrated in Figure 1, the zone of proximal development (ZPD) is the distance between what learners can achieve by themselves (zone 1) and what they can achieve with assistance from others (help). The skills that the individual has already mastered constitute his or her actual level. The skills that the individual can perform when assisted by a more capable person or some other means of mediation constitute the potential level (zone 2). Thus, learned skills provide a basis for the performance of new skills. When these skills in turn become autonomous and stable, a new zone (zone 3) can be created to make possible the acquisition of further skills.
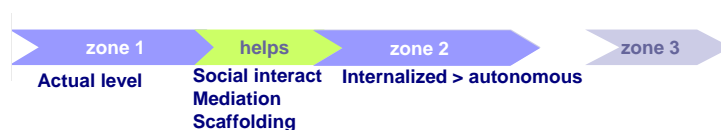
independence (pro-inde) (Phadvibulya 2005). The four dimensions of autonomy are viewed analytically in terms of the *psychological planes* and *motives* (see Figure 2).

The first two dimensions of learning autonomy ("interdependence" and "independence") are based on Vygotsky's work on psychological planes in developmental psychology. He explained that learning begins from the starting point of the learners' existing knowledge and experience and develops through social interaction or some other means of mediation (e.g. tasks, resources, technology). Based on the belief that every function in the ZPD appears twice: first, on the social level (inter psychological),

Figure 1: The zone of proximal development

EFL learning autonomy

The concept of ZPD offers a supporting explanation of how learning autonomy can be fostered and developed. The HybridNTELL model suggests four interactive dimensions of autonomy development based on current thinking on learning autonomy and social constructivism theory. The four dimensions are assumed to require different degrees of autonomy from the least to the most as follows: reactive-interdependence (re-inter), reactive-independence (re-inde), proactive-interdependence (pro-inter), and proactive-

and later, on the individual level (intra psychological), collaboration is viewed as a key factor in the development of autonomy (Little 1996). In the 21st century, collaboration is even viewed as an act of autonomy since learners must have 'the capacity to participate fully and critically in social interactions' (Little 1996: 210); and 'to cooperate with others and solve conflicts in constructive ways' (Kohonen 1992). This constitutes what Littlewood (1999) defined as the 'collective structure' of autonomy.
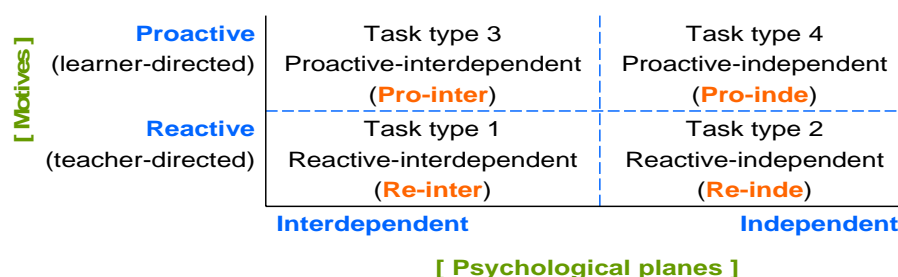
	Task type 3	Task type 4
Proactive (learner-directed)	Proactive-interdependent (**Pro-inter**)	Proactive-independent (**Pro-inde**)
Reactive (teacher-directed)	Task type 1 Reactive-interdependent (**Re-inter**)	Task type 2 Reactive-independent (**Re-inde**)
	Interdependent	**Independent**

[Psychological planes]

Figure 2: Four interactive dimensions of learning autonomy in HybridNTELL environment

The other two dimensions are based on Vygotsky's concept of motives in a pedagogical goal-directed activity: teacher-directed (other-regulated) and learner-directed (self-regulated) dimensions. Littlewood (1999) proposed two types of autonomy: reactive and proactive autonomy. The "reactive" type, once a direction has been initiated, enables learners to organize their resources autonomously in order to reach their goal. Learners do not create their own directions. The "proactive" type is the kind of autonomy we find when learners determine objectives, and make informed pedagogical decisions based on some form of evaluation (Little and Dam 1998). The learners affirm their individuality and set up directions in a world which they themselves have partially created.

In brief, social constructivist theory is interpreted and applied to frame pedagogical functions in class. The application of network technology to enhance language learning experience is designed to suit a hybrid learning environment where asynchronous online communications enhance face-to-face learning events. Thus, the rate of interaction, chances to be exposed to the target language and class contact hours can be extended.

Task design

The four dimensions of autonomy (Figure 2) are used to frame the task design in the HybridNTELL learning environment. Accomplishment and performance in each task type show learners' development in each dimension of learning autonomy. The four task types are plotted to foster each dimension of autonomy.

All task types were created based on the belief that university level learners should "deploy whatever language they already have, and look for ways of building on that, of improving and expanding on their current language capabilities" (Willis 2005: 15) where "meaning is central and opportunities for language use abound" (Willis 2005: 5). Interdependent tasks (re-inter and pro-inter) were designed from the notion that the learners co-construct the activity they engage in during the task. In re-inter tasks, the co-construction of knowledge is based on goals set by the teacher while in pro-inter tasks, the students co-construct the activity based on their "own socio-history and locally determined goals" (Lantolf 2000). In doing interdependent tasks, learners are provided with collaborative dialogue platforms—asynchronous online and synchronous in class—as tools for

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mediated learning. For independent tasks, learners are encouraged to search for their own mediated learning tools under the teacher's guidance and reflect on their learning in a weblog[4]. This idea is supported by a number of researchers viewing "reflection as a key psychological component of autonomy" (Benson 2001: 90).

In the HybridNTELL environment, learning is an ongoing interactive process. Each of the same task type offers different levels of challenge to different learners. The learners' responses to those challenges different levels were interpreted as their degree of autonomy or ZPD. Social constructivist theory suggests that tasks are a form of mediation. The four different task types mediate learning with the teacher's scaffolding (reactive tasks) and collective scaffolding (interdependent tasks). Also, independent and proactive tasks provide opportunities for learners to exercise further transferable skills. The four task types hold different dimensions, criteria and degrees of learner control over their learning. However, each task is considered equally important for the learning process and EFL learner autonomy development, and is given equal weight in the learning outcome.

Classroom environment design

In a HybridNTELL environment, tasks are the major control over class management and organization. The four tasks define the roles of other factors in the learning environment. The related factors illustrated in Figure 3 are adapted from Engeström's

(1987) activity system. The system was developed from the work of Vygotsky (1978) and Leontiev (1978). First, tasks inform whether *Subject* is regarded as a person working individually or a group working collaboratively. Second, tasks notify whether "Object" is the outcome of learner-directed or teacher-directed activity. Social constructivist theory explains that any given activity is interpreted and reshaped by students in actual performance and outcomes are diversified due to performers' orientation and interpretation (Coughlan and Duff 1994, Roebuck 1998, 2000 as cited in Lantolf and Thorne 2006). The diversity is due to the fact that an individual's history impacts action and motives for their learning. For this reason, the rules of HybridNTELL involving the way to direct, manage and assess learning outcomes were set to be flexible and formative in response to the students' ZPD. "Division of labor" is done through the stratified random assignment technique to keep a balance between having a mixed ability group and learners' opportunity to form a group with shared interests. The mixed ability nature of the students in groups leads to establishment of a "community" of practice where each individual helps construct knowledge for the community. Finally, selective use of mediation tools is also influenced by task type. From the perspectives of learner autonomy study, there are six ways to foster learner autonomy (Benson 2001) which are regarded as mediation tools in the HybridNTELL environment. The six mediation tools are presented in Figure 3.

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[4] Weblogs are short-form online journals that refer to each other and invite comments. It is used in the HybridNTELL environment as students' portfolio or showcase.
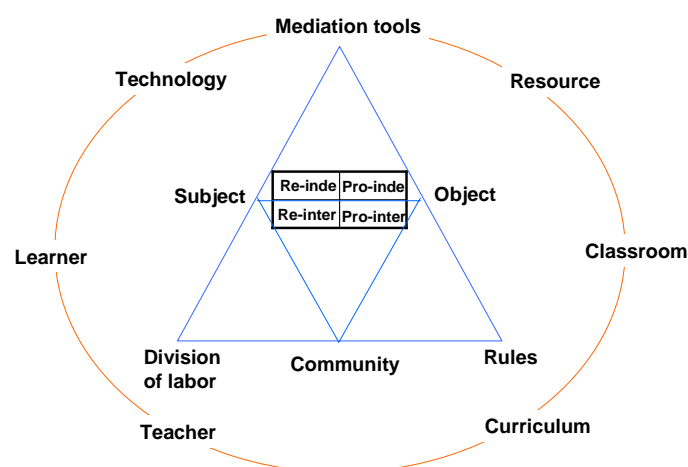
Figure 3: Application of activity system (Engestrom 1987: 87)
and mediation tools (Benson 2001: 11)

The explanation of each mediation tool in the HybridNTELL model is given clockwise as follows. First, in resource-mediated learning (assumed for all tasks), the focus for the development of autonomy is placed on the learner's independent interaction with learning resources (e.g. textbook, websites, dictionary, etc.). This type of mediation offers learners the opportunity to exercise control over learning plans, the selection of learning materials and the evaluation of learning.

Second, in a classroom-mediated learning approach to the development of autonomy, students are provided with the opportunity to make decisions regarding their learning within a collaborative and supportive environment. To serve this approach, content-based and task-based language instruction should be designed to offer opportunities for learners to partially or fully make their own decisions and to bring in their own interests. The design of

classroom learning is related to how the curriculum is planned.

Third, a curriculum-mediated learning approach has been formalized in the idea of process syllabus, in which learners are expected to make decisions concerning the content and procedures of learning in collaboration with the class and their teacher. In this case, "Objects" and "Rules" can be negotiated in class to reach a mutual agreement. Adjustments are made to cater to the students' ZPD. The HybridNTELL model takes the view of content-based learning which is influenced by Vygotsky's classic idea of "Language and Thought". The focal realization of content-based EFL learning is grounded in the idea that language is learned best in the context of use. When language is relevant and functional, learners have real purposes for using language, and through their language use, they develop control over the processes of language. A strong justification of content-based EFL learning for university students lies in the fact that

the students are diverse and are in the transition to real-life language use. Their English has been enriched with linguistic resources that they can retrieve to advance their skills in a real context of use. In the HybridNTELL model, language functions are embedded in each theme (i.e. language for comparison and contrast related to entertainment; language for time sequence related to technology; language for causal relationship related to environment). The four language skills (i.e. listening, speaking, reading, writing) are interactively combined with linguistic mechanisms (i.e. pronunciation, spelling, grammar, and vocabulary). The content-based approach thus provides a semi-pedagogical/authentic language use arena for the students to further develop whatever linguistic skills they have.

Fourth, "Teacher" in autonomous learning has three basic roles: a facilitator who provides support for learning; a counselor who gives advice in learning; and a resource provider who possesses a source of knowledge and expertise. In other words, the teacher in the HybridNTELL model helps learners to plan and carry out their independent or interdependent learning by means of needs analysis, objective setting, work planning, materials selection, organization of interactions, and development evaluation.

Fifth, a learner-mediated learning approach focuses on the production of behavioral and psychological changes that will enable learners to take greater control over their learning. Social constructivist theorists (Lantolf 2000a, 2000b, Donato 2000, Wertsch 1991 based on Vygotsky 1978) maintain that learning is a socially situated activity rather than an individual activity. Individuals obviously do play a role in learning, but what they will

eventually be able to do by themselves, they first achieve collaboratively during social interaction. Research (e.g. Pontecorvo and Zucchermaglio 1990, Tudge 1990) showed growing evidence that collaborative learning between peers, regardless of ability, activates the zone of proximal development. Successful learning involves shifting control within activities from social to individual (from interdependence to independence). In a HybridNTELL environment, students are encouraged to take different degrees of control over different task types so that their ZPD can be monitored and extended. Finally, they are expected to take greater control over their learning.

Finally, a technology-mediated approach to the development of autonomy in the HybridNTELL model aims to facilitate interaction in foreign language classrooms. Network technologies provide opportunities for collaborative learning, interaction among learners, and between learners and teachers that could otherwise be difficult to achieve in the foreign language classroom. Thus, the network technology-enhanced language learning (NTELL) platform is integrated into classroom learning in a way that takes into account the other five approaches.

Design of NTELL platform

The NTELL platform (see Figure 4) is accessible by any member from anywhere and at anytime. The platform was created on a pedagogy-based learning management system[5], and such featured activities as an electronic discussion board, wiki[6], online

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[5] For example, Moodle, WebCT, Blackboard, etc.

[6] Wiki technology enables documents to be authored collectively in a simple markup language using a web browser. "Wiki wiki" means "super fast" in the

quizzes and external weblogs anchored to the class website were used to support the design of learning activities. Within the environment, content is customizable due to the fact that everyone is empowered to help construct a flexible and adaptable learning environment. Thus, learning occurs through the act of creating something for others to see, by observing the actions of peers, and from relating new knowledge to personal contexts. Thus, a community of practice can be created out of the flexible nature of the online platform.

Implementation of the HybridNTELL model: Methodology and procedures

The HybridNTELL model was implemented in an English foundation course for Chulalongkorn University first-year students over a semester (sixteen weeks). Face-to-face meetings took place every week, two ninety-minute on random days of the week. for three hours: ninety minutes each on any two days during a week. In the first seven weeks, a series of orientations were delivered. Then, the HybridNTELL tasks

Homepage

Electronic discussion board

Figure 4: NTELL platform in www.ntell.culi.chula.ac.th

Hawaiian language, and it is the speed of creating and updating pages that is one of the defining aspects of wiki technology. The Wiki module in HybridNTELL enables participants to work together on a project using web pages to add, expand and change the content. Old versions are never deleted and can be restored so that learners can trace back their process of learning as an individual or a group.

were implemented in the next nine weeks. The use of NTELL provides more contact hours and flexibility in the online learning environment. Some tasks were modified from the curriculum and added to the syllabus to serve the practice of the four dimensions of autonomy development in the HybridNTELL environment.

In the environment, tasks were organized around the collective participation and contribution of knowledge in the classroom website. Different sections of the website were to be realized by smaller teams cooperating with each other. Motivated by the initial object of the language learning activity, in this case the construction of the website, the subjects (who can be individual students, teams, or even teachers) carry out chains of actions that are oriented towards the realization of the website.

These goal oriented actions focus on both language use, such as the creation of the information given by the site, and on the development and acquisition of transferable skills, such as information retrieval, or organization of presentation. The realization of actions by the "subjects" is mediated by a number of tools and artifacts. The artifacts include the students' group websites providing linguistic information on topics relevant to the students' chosen themes (e.g. movies, traveling, music, food, books, etc.). As the activity unfolds, the subjects create artifacts such as written or spoken texts (e.g. content for the website, reports, minutes, postings, oral presentations, etc.). Non-material tools can be of a cognitive or metacognitive nature, such as planning and intentions, organizing, and decision-making, and include both the first and second languages. Material tools include technology, such as networked computers available in the self-access language unit, the NTELL Environment, and generic software, such as Microsoft Office, email, or electronic dictionary software (e.g. CollinsCOBUILD), which are all externally enabled by the university.

The individual subject belongs to a wider community comprising his/her class group and the teachers. The community's collective activity is mediated by the range of available tools and language learning artifacts previously outlined, in particular by communication tools provided by the NTELL environment and by a certain division of labor. The division of labor occurs when a team of students collaborate and distribute the realization of sub-tasks (e.g. article writing, preparation for oral presentation) between themselves. Then, the rules are set when the teacher imposes a certain way of completing the task and grades the students' performance. A number of rules and conventions, such as assessment regulations and the requirement to use English to communicate, mediate the relationship between either the subject or the community and the object of the learning activity.

Through the realization of the activity or actions, the object is transformed into an outcome, which can be measured in terms of language performance, transferable skills and learner autonomy. In other words, as students direct their actions towards the construction of the website, they develop and consolidate a range of skills and competencies that can be assessed.

An application of the HybridNTELL model provides nevertheless a starting point for carrying out judgmental and empirical analyses, which can address a variety of issues and research questions relevant to the investigation of the relationship between the HybridNTELL model and learner development. The interweaving of individual and collaborative actions mediated by technology indeed offers a suitable context for such an investigation. It is necessary, however, to

further explore the mediating role of tools and artifacts, and in particular that of Information Technology, from a social constructivist perspective as well as the human factors offered in the hybrid learning environment.

HybridNTELL model research

The HybridNTELL model was evaluated to ensure its effectiveness from the perspective of social constructivism. The evaluation was guided by the following three research questions:

1. To what extent do participants with different English proficiency levels demonstrate different degrees of autonomy during a language learning course?
2. How does the participants' development of autonomy in the HybridNTELL model enhance their language development?
3. Which of the variables in the HybridNTELL model can predict participants' development?

Since learning outcomes in the HybridNTELL model were assessed based on a social constructivist perspective, the students' ZPD was taken into account in order to (1) foster EFL learner autonomy and (2) facilitate learners' language development.

Research procedures

The assessment of degrees of EFL learner autonomy and their language development was based on both objective standardized tests and a set of procedural tests. To answer the first question, the Chulalongkorn University Test of English Proficiency (CU-TEP), a set of standardized tests of English proficiency, was administered before the beginning of the course as a pre-test. The test results were used to select participants and to measure their actual levels of English proficiency. Then, the participants' degrees of autonomy were assessed holistically based on their performance on the four task types.

To answer the second question, the participants' degrees of autonomy were compared with their development in English proficiency measured by three aspects of assessment. First, their general development in English proficiency was measured from the difference between the pre-test and the post-test scores based on two different sets of the CU-TEP. The post-test was administered after the end of the course. Second, the participants' scores from curriculum-based assessment administered campus-wide were used to examine whether the participants learning with the HybridNTELL model make better progress than the rest of the population. Finally, since the CU-TEP and curriculum-based assessment are not sufficient to investigate the participants' multi-faceted language development qualitatively, the participants' language use in their task performance was measured focusing on four aspects of development: (1) fluency; (2) accuracy; (3) complexity (both grammatical and lexical); and (4) a focused language function based on the curriculum (i.e. comparison and contrast writing). The results show how degrees of autonomy relate to degrees of language development.

To answer the last question, the predictive variables in HybridNTELL model design, i.e., degrees of autonomy, interaction patterns, discourse types and teacher's help were measured. The results were used to predict the participants' language development.

Population and participants

HybridNTELL was implemented with a group of one hundred and forty-three Chulalongkorn University students selected from the whole population of two thousand six hundred and forty-six students. At the beginning of the course, the group of the students was drawn from the population with the mean score of their English proficiency (M = 454.18, SD = 41.66) showing no significant difference compared to the mean score of the population (M = 454.03, SD = 42.94), t = .185, p = .854. The score range of the entire group fell within the standard deviation of the population based on the 68% rule in excluding the outliers from the experiment.

Fifty social science students were in one class (class A). Forty-seven biological science students were in another class (class B). Forty-six technological science students were in the other class (class C). The three classes were not significantly different in terms of language proficiency (Table 1) which is assumed to influence their learning and development.

Table 1 Three HybridNTELL classes

	English proficiency (CU-TEP scores)		
	Mean scores	Ranges	SD
Class A (n=50)	458.75	403-547	28.45
Class B (n=47)	452.87	390-541	34.56
Class C (n=46)	450.83	393-537	30.54

The score ranges based on the Common European Framework Reference (CEFR) (Figure 5) were used to stratify the students into three groups: high proficiency (H) with a score range of B2 (480-559), mid proficiency (M) with a score range of B1 (420-479), and low proficiency (L) with t a score range of A2 (380-419). Then the stratified random sampling method was used to recruit ninety participants from the H-M-L groups. Thirty students from each group were randomly selected to participate in the experiment.
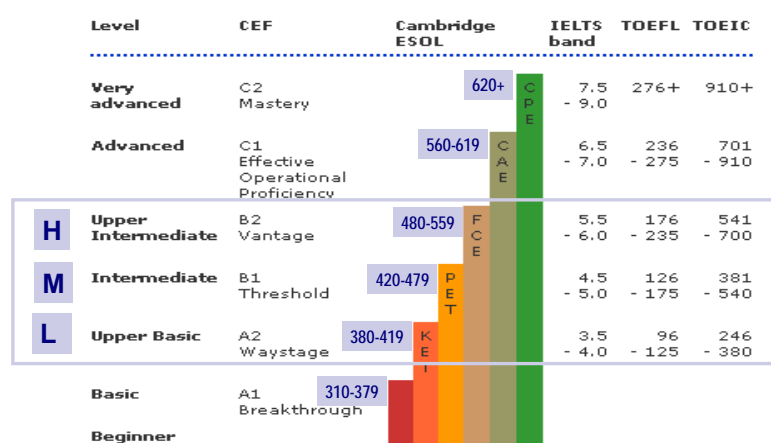

Figure 5: Population in the experiment based on CEFR descriptors

Being aware that the students were selected from three different classes, the effects from the HybridNTELL environment was ensured by controlling the following major variables to create homogeneity: the teacher, the content, the sequence of the content and the delivery methods. However, there was no comparison group in terms of effectiveness testing, but the development of learners in each proficiency group was compared to ensure HybridNTELL model effectiveness with students at all proficiency levels.

Research instruments, data collection and analyses

The process of data collection involved the selection of instruments, data sources and types, method of data analysis, and validity and reliability of the measurement. The following report of data collection and analysis was based on the three research questions.

The first question aimed at investigating to what extent participants at different English proficiency levels demonstrated different degrees of autonomy during a language learning course. The participants' English proficiency scores as measured from the CU-TEP taken before the beginning of the course and their degrees of autonomy were examined by 3 x 4 factorial analyses of variance (ANOVA). The participants' degrees of autonomy were assessed from their performance in the four task types based on a set of holistic assessment schemes. The schemes corresponded to the course curriculum designed by the course committee. The participants' task performance was double rated by a colleague of the researcher who has extensive knowledge of the dissertation study and teaches the same

course in which the HybridNTELL model was implemented.

The second question addressed the issue of how the participants' degrees of autonomy in the HybridNTELL model enhanced their language development. The independent variable, the degrees of autonomy, was compared with three dependent variables: the improvement of English proficiency measured from pre-test/post-test scores, curriculum-based achievement, and the four aspects of objective language development investigated qualitatively from the tasks. The analyses of the variables were described in four stages.

First, the participants' degrees of autonomy were analyzed using descriptive statistics. Second, the different degrees of autonomy were compared with the participants' improvement of English proficiency level overtime. The improvement was measured from the difference between pretest and post-test scores, determined by a Paired-sample *t*-test. Third, the difference between the curriculum-based achievement test scores of the experimental group and the population was investigated by an independent *t*-test to find out whether the participants demonstrated a higher achievement than the population given that their English proficiency levels were not significantly different before the beginning of the course. Finally, the participants' language development based on performance and development in the four task types was analyzed using descriptive statistics.

The third question examined which of the variables in the HybridNTELL model can predict students' development. The students' degree of autonomy, pattern of interaction,

types of discourse in the interaction, and degree of teacher's scaffolding were analyzed. Then Pearson's product moment correlation coefficient (*r*) was used to conduct bivariate correlation analyses between the variables and the students' improvement of English proficiency and curriculum-based achievement.

Findings and discussion

This study investigates how the students with different proficiency levels learned in and benefited from the HybridNTELL environment. Results from quantitative and qualitative data analyses are reported below.

EFL learners with different proficiency levels and degrees of autonomy

The study firmly suggests that previous English proficiency levels have no effect on the students' autonomy and language development. The pre- and post-test scores reveal that the learners improve their language skills (F (2, 87) = 7.04, $p < .001$) regardless of their previous English proficiency levels, F (2, 87) = .24, $p = .078$. However, there is an interaction between the effect of English proficiency levels and degrees of learning autonomy demonstrated in the four task types (F (6, 87) = 15.96, $p < .001$) on the improvement of English proficiency (Figure 6).
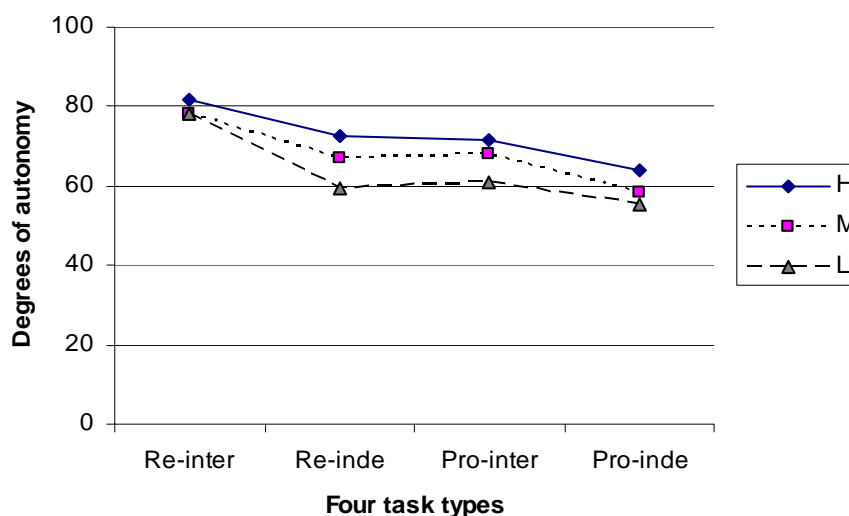

Figure 6: Interaction effects between students' previous English proficiency levels and the four task types on their degrees of autonomy

Although previous proficiency levels did not affect the participants' development, different task types appeared to have different effects on the degrees of autonomy participants in different English proficiency groups demonstrated. The Re-inter task type showed less effect on distinguishing the participants' different degrees of autonomy. This was partly due to the nature of the task type which encouraged the participants to work collaboratively towards the shared goal. The results imply that the Re-inter type has an equal chance either to encourage participants at all proficiency levels or to hinder the accountability of an individual. Some group members might not participate fully in the task but acquired the same scores as those who worked hard to accomplish the task.

The Re-inde task type yielded the most significant effect on the degrees of autonomy the participants with different English proficiency demonstrated. The participants were required to work alone in reaction to the teacher's direction. The results showed that the participants at higher English proficiency levels had better control over the Re-inde task type since task accomplishment relies on the language resources the participants possess and requires minimal creativity on the content.

The Pro-inter task type appeared to create interesting phenomena. The participants demonstrated a lower degree of autonomy in Pro-inter than in Re-inter tasks despite both providing collective scaffolding. It can be assumed that the Pro-inter can distinguish participants at different proficiency levels. However, results showed that the participants with moderate

English proficiency had almost as high a degree of autonomy as those at high proficiency levels. Interestingly, the participants with low English proficiency demonstrated more control over the Pro-inter task type than the Re-inde type. An assumption is that collective scaffolding is more beneficial to the M and L proficiency groups.

The Pro-inde task type seems to be difficult for participants at all English proficiency levels. The participants appeared to have more control over the Pro-inter than the Re-inde while they had less control over the Pro-inde. The two proactive tasks yield far different results. The difference in the degree of autonomy of the moderate English proficiency group towards the two proactive task types is interesting in that the Pro-inter type encouraged them to have high control over their learning, much like the high proficiency group, while the Pro-inde led them to have less control over the learning, which is more similar to the low proficiency group.

The general difficulty the Pro-inde type posed to the students might be due to other factors such as their experience and culture. From a personal conversation with Dr. Sudaporn Luksaneeyanawin (March 21, 2007), Thai students in the primary and secondary education system have less opportunity to conduct, reflect and monitor their learning process, which are the main focuses of the Pro-inde task type. This is due to large class size and the teacher-based approach to instruction. As a result, the Pro-inde appeared to be the less familiar task type.

Learners' improvement of English proficiency

The results from the Paired-sample *t*-test indicated a significant difference between the students' pretest scores ($M = 454.18$, $SD = 41.66$) and their post-test scores ($M = 469.32$, $SD = 48.45$), $t = 12.90$, $p < .001$. This difference demonstrates that participants' English proficiency improved over time. Table 2 provides a descriptive summary of the participants' pre- and post-test performances.

The diversity of improvement was illustrated by each group's standard deviations. The standard deviations of the high proficiency group in both pre-test and post-test scores are the widest. The results show that the high proficiency group continued to be more heterogeneous while the low proficiency group appears to be more homogeneous. Nevertheless, the low proficiency group shows a greater increase in standard deviations than the mid proficiency group, while the average development of the whole group is greater in the mid proficiency group. The range of pre-test and post-test scores suggests that some participants in the low proficiency group made a greater improvement, reaching the same level as those in the mid proficiency group. Some participants in the high proficiency group made even further progress (see also Table 3).

Since the range of H-M-L proficiency levels is quite broad, improvement of the participants' English proficiency is not clearly shown. Thus, the scores of each English proficiency level were subdivided into narrower ranges based on 10-point interval on the score rank (see Table 3) of CEFR bands. After the experiment, twenty participants in the low proficiency group (A2 upper basic level) progressed to the threshold level of B1. Five participants at a moderate level of proficiency progressed

Table 2: A descriptive summary of the difference between
pre-test and post-test scores

	Groups	Mean	Max	Min	Range	Std. Deviation
Pretest	H (N=30)	504.73	547	480	67	18.85
	M (N =30)	447.80	473	428	45	13.63
	L (N =30)	410.03	417	390	27	9.08
	Total (N =90)	454.19				41.66
Posttest	H (N =30)	519.97 (+15)	576	482	94	24.77 (+6)
	M (N=30)	463.90 (+16)	500	437	63	15.16 (+2)
	L (N =30)	424.10 (+14)	462	403	59	12.33 (+4)
	Total (N=90)	469.32 (+15)				43.45 (+2)

Table 3: Details on the improvement of English proficiency

Pre-test proficiency level	Pre-test ranges	Post-test ranges	Post-test proficiency level
HH C1 (550-619) N = 0	610-619		HH C1 (550-619) N = 6
	600-609		
	590-599		
	580-589		
	570-579	H7(N=1)	
	560-569	H5(N=1)	
	550-559	H6(N=1) H5(N=1) H4(N=1) H3(N=1)	
H B2 (480-549) N = 30	H7: 540-549 (N=1)		H B2 (480-549) N = 29
	H6: 530-539 (N=2)	H6(N=1) H5(N=2) H4 (N=1)	
	H5: 520-529 (N=6)	H5(N=1) H3(N=4)	
	H4: 510-519 (N=2)	H3(N=1) H2(N=1)	
	H3: 500-509 (N=10)	H3(N=2) H2(N=1) H1(N=3) M3 (N=1)	
	H2: 490-499 (N=3)	H1 (N=6)	
	H1: 480-489 (N=9)	H2 (N=1) M6(N=4)	
M B1 (420-479) N = 30	M6: 470-479 (N=4)	M5 (N=2) M4 (N=2) M3 (N=1)	M B1 (420-479) N = 45
	M5: 460-469 (N=3)	M5 (N=1) M4 (N=1) M3 (N=3) M1 (N=1) L4 (N=1)	
	M4: 450-459 (N=5)	M4 (N=2) M3 (N=3) M2 (N=3)	
	M3: 440-449 (N=10)	M3 (N=1) M2 (N=1) M1 (N=3) L4 (N=1)	
	M2: 430-439 (N=4)	M3 (N=1) L3 (N=9) L2 (N=1)	
	M1: 420-429 (N=4)	L4 (N=5) L3 (N=3)	
L A2 (380-419) N = 30	L4: 410-419 (N=19)	L4 (N=2) L4 (N=1) L3 (N=2) L2 (N=2)	L A2 (380-419) N = 10
	L3: 400-409 (N=7)	L3 (N=1) L2 (N=2)	
	L2: 390-399 (N=4)		
	L1: 380-389		

to the high level of proficiency. Six participants at B2 or upper intermediate level progressed to C1 or advanced level. Although the majority of participants remained at the same level, some made progress within their own range (according to the subdivided ranges in column 2 and 3 in Table 3). The participants in the high proficiency group (H) made different degrees of progress (H1-H7). The numbers after the letters H, M, L show the ranges of progress the participants made (i.e., H1=10-point increase made by a participant with high proficiency).

The results show that the means of post-test scores are higher than those of the pre-test scores of all three groups. It is likely that the HybridNTELL model did not obstruct participants in any group. However, looking through a social constructivist lens, participants, despite having the same actual development level, demonstrated different degrees of potential development.

Learners' curriculum-based achievement

The participants' achievement was examined by comparing their curriculum-based achievement test scores with those of the population the group represents. At the beginning of the course, the participants were drawn from a population whose English proficiency mean score ($M = 454.18$, $SD = 41.66$) showed no significant difference compared to the mean score of the population ($M = 454.03$, $SD = 42.94$), $t = .185$, $p = .854$. After a semester, the participants had higher scores on the achievement test ($M = 32.24$, $SD = 4.40$) than did the population ($M = 28.35$, $SD = 6.09$), $t = 6.66$, $p < .001$). The standard deviation also exhibits less variety within the participants as related to the population group.
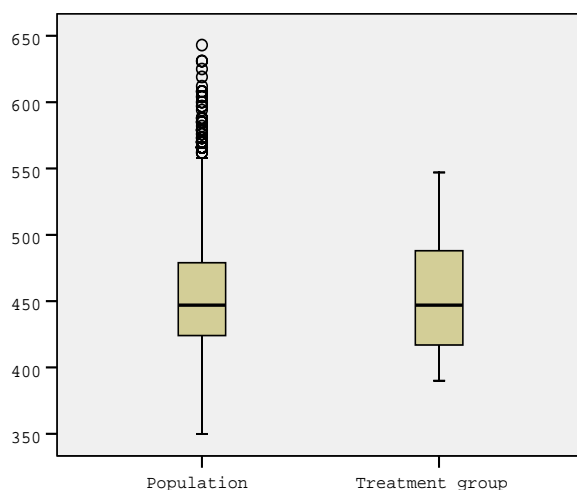
Figure 7 shows the change over time of the population and the participants. The majority of the population showed good performance on the achievement test. However, the participants made better progress. It is interesting to investigate the factors leading to the higher scores the participants gained on the achievement test. Further observations on the participants' achievement in the next section provide interesting explanations to the phenomenon.

Objective analysis of language development in task performance

Since interaction and contact hours were enhanced in the HybridNTELL environment, there was a large corpus of production for objective language analysis. The researcher carefully selected data that represented the participants' language development over time based on social constructivist theory. Three task cycles in repetition of the Pro-inter task type were selected since the task involved the

Proficiency test score (pre-test)   Achievement test score (final test)
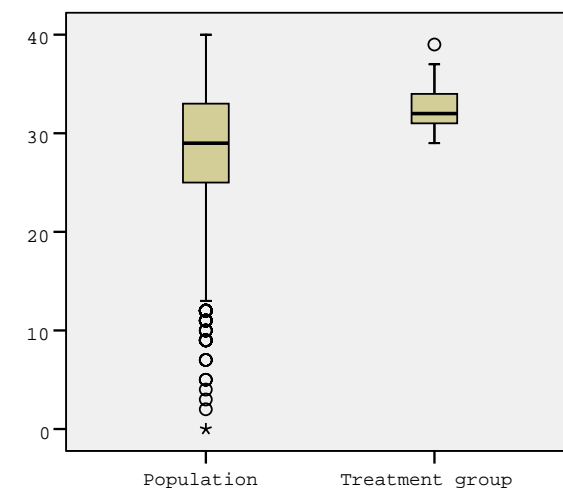

Figure 7: The participants' curriculum-based achievement

participants' written language development through collective scaffolding, which relates directly to the concept of the ZPD. The first draft and the second draft of each task cycle were analyzed.

The language production collected from the work of twenty-seven out of ninety participants was investigated further to see their language development over time. The twenty-seven participants were randomly selected from each proficiency group: high, mid and low, based on their different degrees of autonomy. They were composed of nine from each of the three proficiency groups: high, mid and low. Three out of nine participants in each proficiency group demonstrated a high degree of autonomy, three demonstrated a moderate degree of autonomy, and the other three demonstrated a low degree of autonomy.

The HybridNTELL model incorporated four selected developmental measures of language development: fluency, accuracy, complexity and a focused language feature. The first three measures were based on the developmental index proposed by Wolf-Quintero, Inagaki and Kim (1998). The measures include (1) the total word count for fluency development, (2) the ratio of error-free T-units per total number of T-units for accuracy development, and (3) the ratio of total number of clauses per T-units for complexity. The underlying assumption is that these three characteristics of language development progress in tandem that more proficient second language writers write more fluently, accurately, and grammatically and produces more lexically complex sentences than less proficient writers. Apart from the three aspects of development, the participants' development in the use of focused language features was also examined to see their growth over time through social

interaction. The language focus in the experiment was the ability to use comparison and contrast features with correct forms and meanings.

This section summarizes the results of the selected twenty-seven participants' language development in four aspects based on the HybridNTELL model measurement: (a) fluency, (b) accuracy, (c) complexity, and (d) a focused language feature.

   (a) The results of an analysis of participants' fluency development (Figure 8) show that the participants with higher degrees of autonomy tended to produce more words than the participants with lower degrees of autonomy regardless of their English proficiency levels. However, those with a high degree of autonomy and with high and moderate English proficiency seem to sacrifice fluency for accuracy or complexity in their second drafts. In contrast, those with a high degree of autonomy and low English proficiency developed their fluency more extensively. The participants with moderate and low degrees of autonomy and high and moderate English proficiency levels tended to show a similar pattern of development to those with low English proficiency in that they did not sacrifice fluency in their second drafts. These participants produced the same number of or more words in their second drafts but their fluency dropped when producing the next new piece of writing. The participants with a low degree of autonomy and low English proficiency appeared to trade off fluency at the beginning and later had the same pattern as those with a low degree of autonomy and high or moderate English proficiency. The investigation into the participants' fluency development showed different patterns according to the degrees of autonomy and English proficiency.
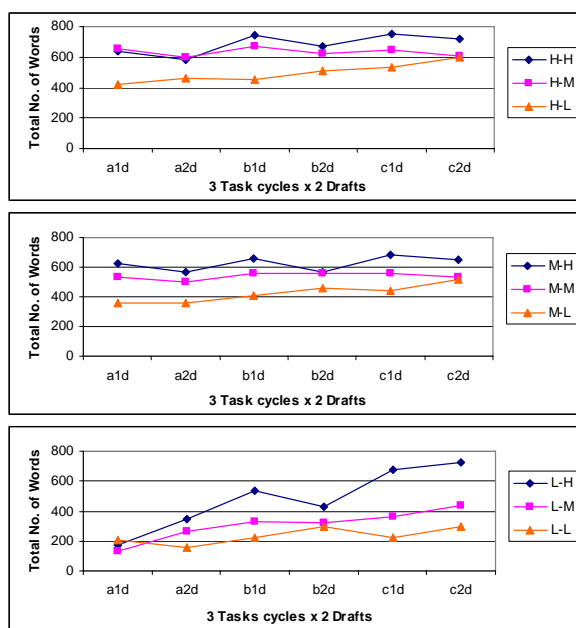
Figure 8: Development in language fluency [7]

Figure 9: Development in language accuracy [5]

(b) The analysis of students' accuracy development (Figure 9) shows that the participants with different degrees of autonomy and English proficiency levels appeared to show accuracy development. The participants with a high degree of autonomy showed development in language accuracy between the first and the second draft, and between the first drafts of all three task cycles. Their second drafts showed more accuracy that those with low or moderate degree of autonomy. With the nature of the Pro-inter task type allowing collective scaffolding, it is

assumed that the difference between the production of first and second drafts shows the participants' ZPD. The first drafts reflected their actual level of development and the second drafts reflected their potential level of development. The relationship between the results of the measures of accuracy and fluency gave a clearer view of the students' developmental patterns. The participants with a higher degree of autonomy tended to develop fluency in their first drafts and accuracy in their second drafts. Those with a lower degree of autonomy showed development in fluency but less accuracy.

(c) The third aspect of the participants' language development is the measure of complexity in their language use (Figure 10). The students were to write comparison and contrast essays, which involve a variety of complex sentence structures. Thus, the development in

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[7] Note: a1d = 1st draft of the first piece of writing; a2d = 2nd draft of the first piece of writing; b1d = 1st draft of the second piece of writing; b2d = 2nd draft of the second piece of writing; c3d = 1st draft of the third piece of writing; and c2d = 2nd draft of the third piece of writing
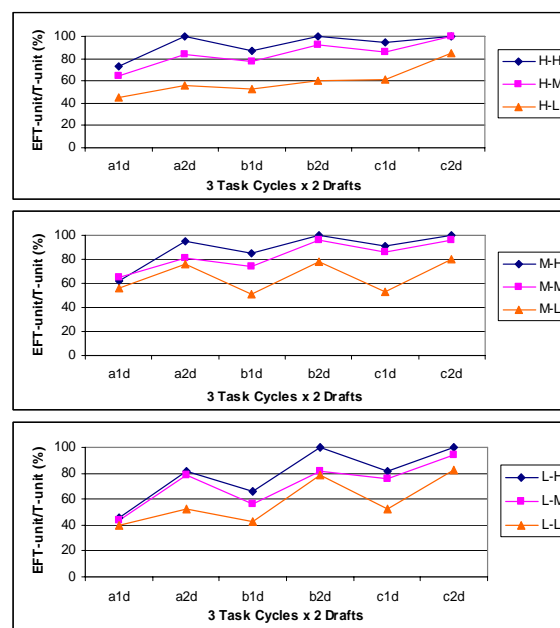
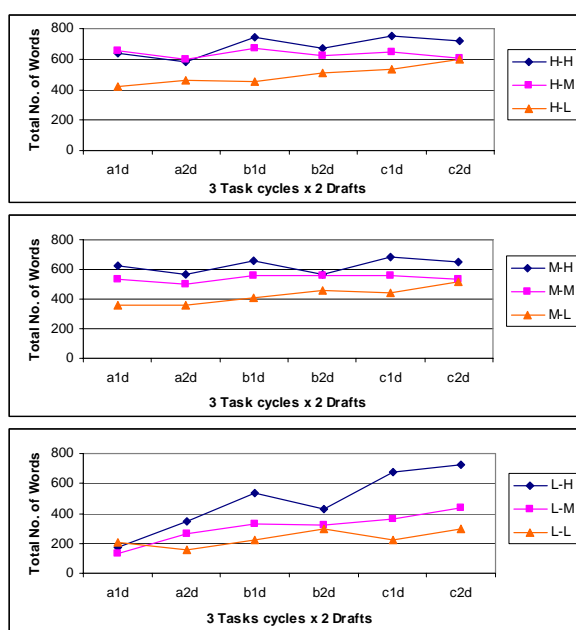Figure 10: Development in language complexity

Figure 11: Development in focused language features

language complexity directly related to development in the use of curriculum-based language focus features. The participants with a high degree of autonomy and high English proficiency showed greater production of language complexity. The development patterns showed constant increases in complexity from the first draft in the first task cycle to the second draft in the last task cycle. It can be assumed that the participants autonomously developed their language complexity through a series of tasks. This language aspect was not the main focus of the lesson but the development might be a by-product of the focused language feature determined in the lesson.

(d) The production of the comparison and contrast feature was examined from the number of T-units containing the feature. The participants
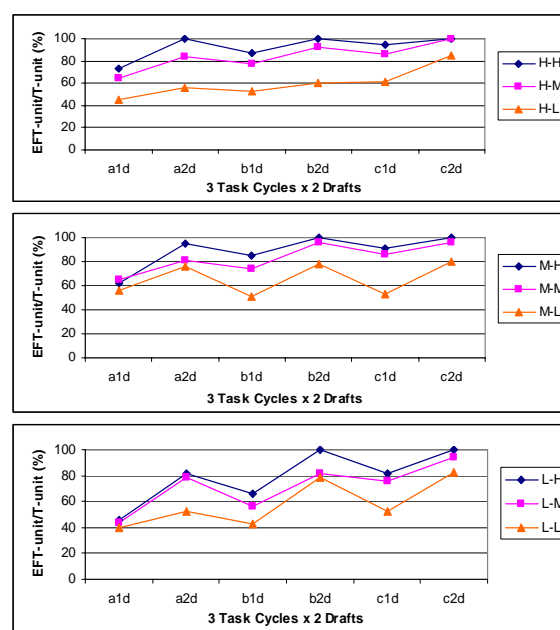
produced an increasing number of comparison and contrast units. Those with higher degrees of autonomy produced a more extensive range of development than those with lower degrees of autonomy.

The analyses above of the participants' language development revealed that those with higher degrees of autonomy showed a greater ZPD than those with lower degrees in all aspects. In addition, the results showed that the prior English proficiency level is not the main effect of the participants' improvement and achievement in their English language learning. The HybridNTELL environment offered students equal chances to improve their English ability regardless of their previous proficiency level. The participants' development was related to their degree of autonomy reflected through their performance on the HybridNTELL tasks. The results ensure that the model has

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positive effects on the participants' learning outcomes.

The HybridNTELL model predictors of students' development

Since the participants' development involved many factors, the researcher attempted to frame the most related variables in the HybridNTELL model for investigating. Observation of the participants' performance was examined from the online interaction recorded on the NTELL database.

Bivariate correlation analyses resulted in four most closely related variables in learner development in the HybridNTELL environment: (1) the degree of autonomy, (2) interaction patterns, (3) discourse patterns in collective scaffolding, and (4) teacher's scaffolding. Table 9 showed the regression analyses of how the four variables are incorporated as strong predictors of students' English proficiency development (R^2 = .81, F = 63.03, p < .001) and their curriculum-based achievement (R^2 = .91, F = 81.54, p < .001).

Table 9: Summary results of regression analyses for variables predicting students' improvement in English proficiency and achievement test scores (N = 90 students)

Variables	Improvement in English proficiency			Achievement test scores		
	Coeff.	Beta	R^2	Coeff.	Beta	R^2
1. The degree of autonomy	.38	.32*	.37***	.65	.58**	.39***
Type 1: Re-inter	.64	.44*		.71	.67**	
Type 2: Re-inde	.81	.76**		.87	.83***	
Type 3: Pro-inter	.59	.59**		.42	.35	
Type 4: Pro-inde						
2. Interaction patterns	.31	.24***	.14***	.39	.27***	.16***
3. Discourse type						
Addressing			.13***			.15***
Critical feedback	.35	.29*		.38	.32*	
Co-construction	.57	.47**		.69	.51**	
Metatalk	.12	.04		.18	.11	
Fostering autonomy	.29	.18*		.34	.24*	
Being addressed to			.04**			.05**
Positive comment	.53	.46**		.69	.51**	
Critical feedback	-.14	-.11		-.36	-.29*	
Co-construction	-.25	-.19*		-.49	-.4**	
4. Teacher's help			.13***			.16***
Content	.48	.36**		.69	.51***	
Language	.73	.62***		.78	.45***	
R^2			.81			.91
F			63.03***			81.54***

* $p < .05$
**$p < .01$
***$p < .001$

As shown in Table 9, better performance on the English proficiency and achievement tests are associated with all variables. The participants' development in task performance is the strongest predictor of both improvement in their English proficiency (R^2 = .37, p < .001) and achievement test scores (R^2 = .39, p < .001). The second predictor for the improvement in English proficiency is the interaction patterns they experienced (R^2 = .14, p < .001). The next equally important predictors are the discourse types they use and the teacher's help (R^2 = .13, p < .001). The online interaction (R^2 = .06, p < .01) and discourse types received from peers' feedback (R^2 = .04, p < .05) are the weakest predictors.

As for the achievement test scores, the third predictors are group interaction patterns (R^2 = .16, p < .001) and degrees of teacher's help (R^2 = .16, p < .001). The next almost equally important predictor is discourse type use (R^2 = .15, p < .001). Online interaction (R^2 = .05, p < .01) and discourse type received from peers' feedback (R^2 = .05, p < .01) remain the weakest predictors for the achievement test scores. However, it is important to note that less association between the teacher variable (or teacher's help) and the participants' development is a good sign. The HybridNTELL model requires that teachers confine their help to just a sufficient degree of association with the students' development. The design of environment and task to promote collaborative learning and self-directed learning should attempt to reduce students' dependence on the teacher. In this context, teachers can act as facilitators observing when help is required and deciding the degree to which it should be provided. Then, self-directed learning and collective scaffolding can be effectively encouraged

to foster learner autonomy. If the teacher's help yields a strong correlation with the students' development, students are prone to be less autonomous.

Findings suggested that the participants made substantial learning progress with the HybridNTELL model but the different degrees of achievement were dependent on the patterns of their learning process in the environment explained by the relationship between the variables above.

Conclusion

This article reported the development and evaluation of the HybridNTELL model as an example of a theory-driven design process and empirical evidence for EFL instructors or researchers in higher education. The model is open for modification, application and further investigation.

The model needs to be implemented more than once in order to calibrate its effectiveness. This current study also left some interesting aspects of HybridNTELL to be further investigated such as discourse use in interaction with training, different teacher's variable, different language themes, learners' use of resource available, and learner language corpus collected from learners' production. Further analysis of particular measures should offer more insightful information on students' development. For example, students' discourse in their collective scaffolding, based on the results, yielded a strong association with their development and thus, should be examined more closely so that appropriate training could be given to equip students with skills for more effective scaffolding. Teacher training is another important issue to be addressed since the findings suggest that teacher

variable holds a degree of association with the students' development. Additionally, the model can be expanded to create an environment where students from different classes collaborate.

In conclusion, to create an active HybridNTELL environment, both effective pedagogical principles including specific instructional goals and procedures, as well as technological tools must be taken into account at the stage of implementation. Although the results reported from this study cannot yet be generalized to the entire university population, it is fair to say that the HybridNTELL model well suited the students' needs. Learners' development and perspectives toward online learning have offered valuable insights into a way to connect the teacher's goals and students' needs in the HybridNTELL environment. Both students and teachers would do well to take advantage of network technologies in order to become active members of a community that thrives far beyond the spatial and temporal limitations of the traditional classroom.

Acknowledgement

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