

Looking At Chinese Students' Strategy Use for English Learning and Use in the Asian Context: *An Ecological and Complexity Perspective*

Zhiguang Huang
Assumption University, Thailand
illls@163.com

Abstract

Against the background of educational globalization, this article first points out the substantially increasing number of Chinese students studying in Asian regions which are different socio-cultural-linguistic contexts from the western Anglophone countries, and calls on the second language (L2) education and English language teaching (ELT) research field to pay adequate attention to these Chinese students' acculturation to the Asian contexts. A research project is then proposed as an exploratory study to investigate the Chinese students' acculturation process at Assumption University of Thailand, which is a typical case of a multicultural and multilingual Asian context of education, through their use of strategies in English learning and use. Basing his educational philosophy on ecologism, the author suggests the adoption of a complexity perspective on L2 learning as a way of interpreting the issues involved in the research. This suggestion is subsequently supported by an overview of language learning strategy (LLS) research, an overview of the development of complexity theory (C-T) and its applications to SLA and L2 education research, and by a pilot study. The author then introduces R. Oxford's Strategic Self-Regulation (S²R) Model as a strategy framework that is appropriate for an integration with C-T for research. Lastly the author outlines the research methodology and wraps up the article by calling for more efforts to establish an ecological perspective in the L2 education and ELT research fields.

Keywords: Ecologism, complexity theory (C-T), language learning strategy (LLS), English language teaching (ELT), overseas education.

*No man is an island,
Entire of itself;
Every man is a piece of the continent,
A part of the main.*

(John Donne)

Background: A growing phenomenon in education

We are living in a world that we call 'the global village' today and are experiencing an era of rapid globalization that has never before happened in human history. People from different parts of the world are rather tightly related with each other, sharing a variety of resources and information, and meanwhile facing a series of serious global issues and crises together.

As a resource that gets more and more internationalized and marketized, education is playing an influential role in pushing forward the world globalization process. This results in the rapidly increasing trend of international student mobility in recent years. It is estimated that the total global demand for international student places will increase from about 2.1 million in the year of 2003 to approximately 5.8 million by 2020 (Xue, 2011).

Against this background of educational globalization, China, with its large population and rapid economic growth in recent decades, has gradually been exerting an essential influence, in the sense of outputting large amounts of overseas students and contributing economic profits to those host countries. According to statistics from UNESCO, up till 2008, the number of Chinese overseas students had outweighed that of any other country, taking up 14% of the total amount of overseas students in the world. (Wang et al., 2009: IV)

In addition to the rapidly increasing number, there is also another significant characteristic displayed in the trend of Chinese experiencing overseas life: nowadays the Chinese people no longer only favor the traditionally developed countries in the West, such as the US, the UK, Canada and Australia, as their destinations for overseas education. More and more Chinese people have preferred to study in some newly-developed countries,

such as Singapore and Korea, or even in some developing countries, such as Thailand, Malaysia, the Philippines and India.

In this new situation, the Asian region in particular is becoming a very popular study-abroad destination among Chinese. According to China's official statistics, the total number of Chinese overseas students in Asia had risen to 25.2% by 2005, with only very slight distance to the 27.9% taken up by those in Europe, and the 32.1% taken up by those in the North and South America together. And largely due to the global financial crisis in 2009, it can be assumed that the actual percentage of Chinese overseas students in Asia today should be even higher than the 25.2%.

There are several reasons for this change. First, study-abroad in the Asian region costs less money than in the western countries, so even working class Chinese families can afford it. Second, because the Asian region is close to China in terms of geographical proximity as well as culture, it to some extent can ease many parents' worries about their children's independence when studying abroad. This may also be an advantage to some students in their consideration for future career development, as they may intend to study, work and stay in some countries near to their hometowns, rather than going so far as in Europe or America. In addition, it can be a matter of students' personal interests, as some Asian countries are becoming more and more attractive for their unique cultures, such as the popular culture of Korea and the tourism culture of Thailand, which have been making these countries not only a heated destination for tourism, but also for overseas education.

Globalization of the world is changing China, and China is changing the world in turn. The substantially growing numbers of Chinese overseas students around the world gradually become a strong influence on Chinese society as well as on the host countries where they stay and study in various aspects, such as the study-abroad agency market, the making of talent-regulating policies by governments and the reconfiguration of educational environments, resources and policies. Influences on these aspects of society have led to a growing concern in the social science research field regarding the quality of the education that the Chinese overseas students receive, and the degree of success they achieve.

This is also becoming a big concern in our second language (L2) education and the ELT research field in particular, as the degree of success in Chinese

students' learning and use of English is one of the most critical factors for their success in overseas education. Possession of adequate proficiency of English will enable the students to engage themselves more easily and appropriately in their overseas educational contexts, where the medium of instruction is mostly in English. Especially as almost all the Chinese students will unavoidably have to face the 'culture shock' to a more or less degree, and experience an acculturation process, English proficiency, at this point, is the transformation point determining in large part the length of transition or acculturation. (Xue, 2011: 17)

However, given the large number of Chinese overseas students in Asia today, very little attention from our research field has been paid to them. Almost all the attention was paid to those in the western countries. In our opinion, there are two important reasons for this situation. Firstly, most researchers in our field have not recognized the rapidly increasing number of the significance or even the reality of Chinese students moving into the Asian region. The second reason, which we considered as more significant, is that many researchers in our field have not realized the significance of contextual differences in evaluating the process and outcome of English learning. They are still taking the western Anglophone countries as the benchmark for the overseas educational environment of Chinese students. Therefore they may think that the studies on the Chinese overseas students in those Anglophone countries are representative and significant enough to serve as the reference for those in any other parts of the world. However, it is time for this conception to be altered. If we take a closer look at the Asian context as the environment for Chinese students to learn and use English for their overseas education, we will find significant differences from the western Anglophone countries. This may bring us a little inspiration.

Firstly, English is not the national language in any Asian country. Although it is an official language in some countries such as Singapore, Malaysia, the Philippines and India, there is(are) also other official language(s) used widely beside English. Secondly, the English language used in Asian countries is mostly of a different variety to those in the western Anglophone countries. The distinct characteristics display at multiple levels, including the phonological, lexico-grammatical and pragmatic levels (Kirkpatrick, 2011). Lastly, English used in Asia is mostly in the communications between non-native speakers, which involve people from various ethnic, cultural and

linguistic backgrounds, with different levels of proficiency and different kinds of accent.

These features speak of the fact that English in Asia is mostly used as a regional lingua-franca in multilingual and multicultural environments. To deal with the learning and use of English in their overseas education process, the Chinese students in Asia will have to face a different socio-cultural-linguistic environment from their counterparts in the western countries. What they face is a world (or a whirl) that is made up of a more complex mixture of various cultural elements, languages and varieties of English. Students naturally have to be confronted with resources, conditions, issues and situations that are specific to this world. Accordingly, they will need to make use of this educational context by accommodating themselves to and making harmony with it if they are to achieve success. In other words, they will have to create a learning culture that is appropriate with this context. And this will be a different process of acculturation from those in the western Anglophone contexts of education.

Therefore, to concern ourselves about the Chinese students' English learning and use in their acculturation process, we cannot rely on the research that only focuses on the western contexts; we must use a 'local eye' to shift our attention to the Chinese students in Asia themselves. Only in so doing are we possibly going to more accurately understand how things are going with them, what difficulties and issues they are confronted with, and what the successful and unsuccessful students in this context are like.

By doing this, we may broaden the scope of our L2 education and ELT research field to reach the expanding study-abroad-in-Asia territory, and enhance our sensitivity to the issues in our present L2 teaching and researching field with a more holistic vision. To the practical end, it may provide implications educators in relevant Asian contexts of overseas education to improve local ELT pedagogy.

Assumption University of Thailand as a case

To conduct an exploratory study of the Chinese students' English learning experience in the Asian context, we would like to propose that Assumption University of Thailand (AU) is a significant subject to focus on. AU is a western-style international University in Bangkok with English as the

medium of instruction and academic work; the lecturers are from all over the world, but they mostly are Asian. Over the past decade it has been attracting more and more Chinese, and the present number of registered Chinese students at AU is over 2000. This brings about a lot of Chinese cultural elements and Chinese language use on campus. In addition, there is a strong atmosphere of other cultures, especially Asian elements, as most of the international students are from Asian countries around the region. Last but not least, there are a lot of Thai cultural elements and Thai language use by a large numbers of Thai students, staff and janitors, and if the Chinese students step outside the campus, they will face a totally Thai society.

This particular environment of AU with onion-like multiple layers of linguistic and cultural scenery makes itself a significantly typical and meanwhile a unique multilingual and multicultural context of overseas education in the Asian ELF for Chinese students. Research on the English learning experience of the Chinese students at AU may inform us about the typical issues that emerge from the Chinese overseas students' acculturation process in the Asian region.

Focus on the Chinese students' use of strategies in their English learning and use

English learning and use in the process of acculturation is quite a broad concept. If we are to research this aspect, we may need to look for a point of penetration. In other words, we may need to focus our attention on a particular theme, so that we can conduct the investigation more systematically and deeply, and eventually we may still able to understand the process holistically. At this point, I suggest that we could specifically focus on how the Chinese students at AU use strategies for their English learning and use across a certain period since they have entered this environment. The reason is that, to engage themselves in learning English at AU requires them to deal with this particular context of education, and the success lies in their adaptation to this environment, which means that they need to recognize, evaluate, establish a harmonious relationship with and make appropriate use of the various social, cultural and linguistic resources on the different layers of the context.

All these responses depend on appropriate use of strategy. Strategy is the action people take in response to the environment they face. The use of

strategy thus reflects the influence that environment sheds on people. If people are to take advantage of the environment, they need to adapt to it by interpreting the resources, establishing a beneficial relationship with them, and regulating them for sustainable development. The realization of this process involves a series of weighing and choice-making decisions, which are processes of strategy use. If we consider the Chinese overseas students' English learning process after they enter AU, we can assume that the processes of strategy use should at least occur in two dimensions. In the first dimension, they will need to adapt to the English learning and use at AU as ELF from their past days in China where English is studied as a foreign language (EFL). This is obvious, as we know that before entering university most students in China learn English in public high school, where students study English only as a subject for getting high marks in the College Entrance Examination, which lays emphasis on grammar, vocabulary and reading. Whereas at AU, the students will be confronted with the linguistic resources in reality, and begin to apply the language to their academic work and everyday life. This dimension of adaptation is in a macro sense, indicating a great shift of learning mode.

The second dimension, by comparison, is more micro. Life and study at AU provide the Chinese students with a lot of opportunities to socialize with people from various cultural backgrounds, and English is used as a lingua franca for their communications, with either native Anglophone speakers or, more possibly, other non-native Asian speakers. ELF communication between non-native speakers means communicative breakdowns and misunderstanding will occur frequently, and the participants will need to learn to adapt to them. For example, they need to become sensitive in recognizing breakdowns from either side of communication, and be able to signal their own non-understanding, and to negotiate meaning when non-understanding occurs. All these require the Chinese students to possess the ability to employ communication (communicative) strategies appropriately.

For ELF communication at AU in an Asian context in particular, a range of linguistic features that are unique to ELF in the region, especially to the Thai variety of English, may shed heavy influence on the Chinese students' learning and use of English, given the fact that most people in the Chinese students' lives at AU, including lecturers, fellow students, university staff and others, are Thai or from the Asian regions around the country. Although the varieties in different Asian countries have their own distinctive features due

to the differences in historical, political, cultural and linguistic backgrounds, it is found that a number of phonological, grammatical, discourse and pragmatic features are shared by many of the speakers in the ASEAN region (Kirpatrick, 2011). In addition, as people at AU will naturally base their communications on their common life and study at AU, which are comprised of the 'communities of practice' (Wenger, 1998) that they share, it is arguable that they will also share common linguistic features at the lexical level, a repertoire of shared vocabulary and locally idiomatized expressions used specifically to refer to the practices in their AU lives. Meanwhile, the dominant use of the Thai variety of English may also add extra power to assimilating the lexical features by the non-Thais absorbed from the Thai side. It thus indicates that the variety (varieties) of English that the Chinese students are exposed to at AU, especially in oral communications, will display a series of distinctive features different from what they have learned from the EFL education in China. Therefore, they will need to recognize these features and the meanings behind them at least for understanding. It requires the use of strategy.

Furthermore, people in multicultural and multilingual environment may encounter more complicated linguistic issues than negotiating for intelligibilities. As Kirpatrick (2011: 139) points out, there are two major functions of language: language for communication; and language to establish identity. The latter is particularly significant, and more often occurs in the language use between multilingual people with different cultural backgrounds, such as those in the context of AU. For example, non-Asian students may adopt the features of the Asian variety (varieties) of English to show solidity in their socialization with Asians. Things can be similar in communications between non-ASEAN and ASEAN students, or between non-Thai and Thai students. In the latter case particularly, the non-Thai students may also code-switch to the Thai language for the Thai students; or they may even do the same to other non-Thai students, in order to express their recognition of a common identity as AU students. In addition, in the above cases either side in the communication event may occasionally code-switch back to their mother-tongue, if they feel a need, whether consciously or subconsciously, to emphasize the difference in their ethnic or cultural backgrounds or other aspects of identity. As such, we assume that the Chinese students will also encounter issues of this type. This requires acute use of strategy, so as to 'play with various linguistic codes and with the

various spatial and temporal resonances of these codes" (Kramsch and Whiteside, 2008: 664)

Issues related to the above-described dimensions indicate the significance to any research of the Chinese students' use of strategy in their English learning and use at AU. A careful record of their use of strategy across a period of time will be able to capture their process of English learning and use; and an insightful analysis will enable researchers to probe into their process of acculturation to this context, and discover the interrelationship in between. We consider the following questions, which correspond with the aspects of adaptation discussed in this section, as most significant to be answered:

1. How do the Chinese students use strategies for English learning and use at AU (as an intact cultural group and as individuals)?
2. How does the Chinese students' use of strategies change as they study at AU (as an intact cultural group and as individuals)?

This question can be considered in two aspects. One is to look at the difference between their past days in China and their study at AU. The other is to look at the difference across their time of study at AU.

3. What are the reasons for the changes of the Chinese students' use of strategies at AU (as an intact cultural group and as individuals)?

This question also includes two aspects. One is to find out what are the factors that have caused the changes; the other is to find out how the factors caused the changes.

4. What similarities and differences does the Chinese students' use of strategies at AU display?

In answering this question, such research will be able to contribute to benefiting local ELT pedagogy with implications for developing appropriate strategy assistance for the students, which may include aspects of strategy instructions, strategic learning materials development and learner counseling.

Ecologism as the philosophical basis

Discussion in the previous sections indicate that globalization has been changing the international market for overseas education, and steering the mobility of Chinese students for study abroad in new orientations, especially towards the Asian region. As such, many Chinese students will need to engage themselves in those new contexts of education. The trend of world globalization and its influences on the study abroad market add a new dimension to the significance of education. Students in universities and schools today need to get prepared for their future life in this more and more globalized world. They may have to encounter and cooperate with people with any ethnic and cultural backgrounds in their work places or everyday life. This requires an ability to get along with cultural diversity in harmony. A prerequisite of this is that people with different cultural backgrounds can understand and respect each other. This is one significant aspect of today's education.

To build up this understanding and respect of others requires students to develop cultural awareness by learning about the commonalities and differences between their own cultures and the others'. At this point, chauvinism of culture is inappropriate, or even dangerous. The communications and dialogues between people need a spirit of equality, respect and cooperation, and this underlies a mindset of cultural ecology. Only with this perspective can people recognize the necessity of cultural diversity in our world, and pursue a harmonious relationship with others in it.

The necessity of the spirit of ecologism in terms of culture is even more immediately relevant to students in the contexts of overseas education. The growth of International settings in education becomes one of the outcomes of the globalizing trend, and is a microcosm of cultural diversity. The value of education demonstrated above will lie in a successful process of the participants becoming successful members of this community (Larsen-Freeman, 2002: 37). As for the case we are discussing here, the Chinese students' process of acculturation will have to be realized by a process of English learning and use, and it critically depends on their ecological relationship with the relevant linguistic resources in the contexts. Furthermore, previous discussion has shown that learners in such a multilingual and multicultural environment as AU may be confronted with more complex and unpredictable linguistic issues of subjective and relative

significance. An ecological perspective will enable us as researchers to 'see various languages used by participants as part of a more diversified linguistic landscape with various hierarchies of social respectability among codes, and added layers of foregrounding of the code itself rather than just the message' (Kramsch, 2008: 396)

Therefore, for the educator and researcher devoted to a survey and evaluation of English learning and multilingual issues in the global age, we propose to hold ecologism as our philosophy of education and culture throughout this case study.

Complexity Theory (C-T) as the methodological basis

The ecological perspective on education, English learning and multilingual issues will equip us with a more holistic mind and vision in capturing educational and linguistic issues. On this basis, we are more sensitive to the complexity, dynamics and unpredictability of the issues emerging from the Chinese students' strategy use in their English learning and use at AU. However, we still need a corresponding methodological approach to describing, examining and interpreting the complexity, dynamics and unpredictability in the research data that we record. Previously there have been two main approaches to second language acquisition (SLA) research, namely the psychological and the social approaches. However, underlying them are two different, or conflicting issues as considered by many. These are perspectives (the psycholinguistic and the sociolinguistic) on SLA, with a fundamental, ontological difference between these two areas (Larsen-Freeman, 2002: 36). Researchers with the psycholinguistic perspective insist that SLA research should have a central focus on explaining the learner's psychological processes, especially the cognitive processes, as the objective of SLA; they thus distinguish between language acquisition and language use, and see the former as its rightful domain. Whereas those with the sociolinguistic perspective criticize the dogmatism and hegemony of the former as mainstream, and contend for an equal emphasis on the social and contextual influence on the learner's linguistic behaviors. These two sides have been competing and it becomes a long-lasting controversy in the field (Seidhofer, 2003).

Although both of these approaches have been continuing their own agendas and making contribution to the field in their own manners, they each have limitations in seeing the whole picture of SLA, if inspected on the ecological

dimension. As we are to look at the Chinese students' English learning at AU as a context of overseas education, we will unavoidably have to probe into the inextricably linked interrelationship between their language acquisition and language socialization processes. At this point, either of the two approaches taken in isolation is restrictive; rather, a larger lens that is able to accommodate the two perspectives will be more appropriate.

While the conflict between the two points of view have fallen into an irreconcilable situation, some researchers with an awareness of the 'ecological challenges' (Mahmoodzadeh, 2012) in L2 education, have been exploring a way out of this dilemma. In this regard, complexity theory (C-T) comes as a frequently proposed paradigm or approach. It is considered as one that supports a social participation view of SLA without excluding the psychological acquisitionist perspective (Larsen-Freeman, 2002). It also shares common ground with the ecological perspective on language education (Tudor, 2003) and can discern and study the intricate effects of ecological variables in a more optimal manner than others (Mahmoodzadeh, 2012).

At this point, we should stop for a while, and think whether the C-T approach is truly appropriate for studying strategy. Then we may need to consult the literature of the research on the strategies used for learning a second language (usually termed as language learning strategy or language learner strategy, or LLS), and get an idea of the current developmental situation in this research field.

Literature review on LLS research

Terminology and definition of LLS: Fuzziness

Terminology

LLS research has been very prolific and much has been written about the field and its importance to language learning (Nambiar, 2009). However, some fundamental issues have been debated throughout the four-decades of the literature. These issues include the fuzziness in terminology and definition.

Various ways can be found to term the strategies used for learning a second language throughout the literature. Some researchers use the term 'learning

strategies' (e.g. Macaro, 2001; O'Malley and Chamot, 1990) or 'language learning strategies' (e.g. Oxford, 1990), and some others prefer 'learner strategies' (e.g. Ellis, 1985; McDonough, 1999; Wenden, 1991), still others use them interchangeably across the literature of empirical studies. 2004 marks a turning point, as 23 top international scholars in the field of 'strategies' gathered and worked together on crucial issues in this field, and the term 'language learner strategies' was put forward as one of the outgrowths of the meeting (Cohen and Macaro, 2007). However, this did not end the messy situation. For example, Rebecca L. Oxford, one of the most influential researchers in this field, maintains 'language learning strategies' as the terminology in her recent work on LLS (Oxford, 2011). This 'regression' seems to be stirring the issue with even more confusion.

Definition

People can easily find a long list of definitions in an overview of the literature of LLS research. For example, Ellis (1994) gives a list consisting of five different definitions by Stern (1983), Weinstein and Mayer (1986), Chamot (1987), Rubin (1987) and Oxford (1990) respectively; after one decade and a half, Zhu (2010) comes up with one that includes as many as twelve. This reveals an issue in this field that definition tends to be 'ad hoc' and 'atheoretical' (Ellis, 1994). Different researchers have defined the strategies used for L2 learning in different ways, according to their personal perception and belief (ibid.). As a result, by reading the definitions closely, we can find that different key words, or synonyms, are employed to refer to strategies in different definitions made by different researchers. Zhu (2010) makes of list of these different key words, which includes "techniques", "device", "behavior", "activities", "thoughts", "actions", "skills", "tricks" and "approaches". This reflects the difference among researchers in understanding the nature of strategy.

The cause of this difference, according to Ellis (1994), lies in a lack of consensus among researchers in regards to the following five aspects: whether learning strategies are to be seen as behavioral (and therefore, observable) or as mental, or as both; whether learning strategies are treated as general approaches or as specific actions or techniques used in particular areas of language learning; whether learning strategies are to be seen as conscious and intentional or subconscious; whether learning strategies are to be seen as having direct or indirect effect on interlanguage development; what motivates the use of learning strategies, e.g. for learning something or for some affective

purpose as well. Different perceptions on these aspects drive researchers to view strategies differently, and thus result in miscellaneous definitions of LLS across the literature.

In a fundamental sense, however, the inconsistency of the perception on strategies can be attributed to the difference in different researchers' theoretical backgrounds in SLA. We may need to review the history of LLS research throughout the past few decades, so that we can get an idea of the theoretical underpinnings of LLS research and make a balanced evaluation of the current situation more appropriately.

The evolution of LLS research

Generally there have been three trends in the LLS research history, which represent three approaches to examining and interpreting LLS. The first trend intended to find out the 'tricks' applied by the good or successful L2 learners in their learning. Joan Rubin initiated this trend with her ground-breaking article published in 1975, *What the "Good Language Learner" Can Teach Us*, and a few other researchers in the following few years conducted a series of studies (e.g. Naiman et. al., 1978; Stern, 1975; Wong-Fillmore, 1976) to expand the exploration. This represents the earliest stage of strategy research in SLA, and a number of significant strategies in L2 learning were identified. However, this trend of research was limited by being only descriptive, speculative and intuitive; hence its lack of learning theory to be referred to as a theoretical basis to explain the roles and functions that the strategies identified play in the L2 learning process.

The second trend is called the psychological approach. It began in the early 1980s, reached its heyday in the 1990s, and still sheds influence on the LLS research at present. Benefiting from the developments in cognitive psychology in the late 1970s and early 1980s, it refers to cognitive theory, especially the information processing model, as the theoretical basis of learning, and considers learning strategies as cognitive skills that help realize language comprehension and language production processes. Strategies were identified and classified by researchers according to a cognitive theory of learning and with reference to important concepts in psychology such as 'metacognition' and 'affect'. The identification and classification of L2 strategies further led to the constructs of strategy survey tools by a few different researchers since the early 1990s. The *Strategy Inventory for Language Learning* (SILL) by Oxford (1990) came as one of the earliest and

most significant; it has been stimulating a huge body of quantitative studies on LLS around the world up to the present.

With the use of such quantitative inventories as SILL, a series of learner variables that influence strategy use were identified and verified. Meanwhile, researchers also found that in addition to learner's individual factors, contextual and situational factors can also affect strategy use. This challenged the psychological approach that views language learning as a computer-like information-processing individual mechanism isolated from social and contextual influences, and the validity of LLS research was began to be questioned. Paralleling with the emerging 'social turn' in SLA (Block, 2003), this situation catalyzed the emergence of the third trend of LLS research, in which some researchers, most of whom were inspired by the Vygotskian sociocultural theory of learning, have conducted a series of qualitative studies (e.g. Donato and McCormich, 1994; Gao, 2006, 2010; Parks and Raymond, 2004) that particularly focused on the contextual factors in a different approach since mid 1990s.

As the sociocultural approach to strategy research was gaining popularity in the past decade, however, limitations have also been found in it. More recent evidence has revealed that a learner is not influenced by context passively; rather contextual factors and individual factors contribute interactively to the evolution of a learner's strategy use across the time scale. As Gao (2010) comments, the learners' strategy use is often a mediated choice (by contextual influence), but nevertheless it remains the learners' choice. The making of a choice is driven by the learner's agency, which comprises of strategic learning capacity, micropolitical capacity, sociocultural capacity and motive/beliefs. Underlying these components of learner agency are various kinds of knowledge, which include metacognitive knowledge within the strategic learning capacity, and knowledge of valued social and cultural practices within the sociocultural capacity. Based on Gao's sociocultural approach, Huang (2011) further points out that strategic learning capacity includes metacognitive knowledge/belief, metalinguistic knowledge and knowledge of self, and they together with the other components of learner agency play an active role in driving learner's strategy use in response to situations. With its development, the sociocultural approach appears to once again touch upon those concepts that have traditionally been established by the psychological approach.

However, the two approaches in LLS research, as a manifestation of the psycho-socio controversy in SLA, have also been considered irreconcilable. Little communication has been made between them. As LLS research has developed up to the present, there is a necessity to find a way out of the dilemma. 'A resolution of paradigm differences can occur only when a new paradigm emerges that is more informed and sophisticated than any existing one' (Guba and Lincoln, 1994: 116, cited in Oxford and Schramm, 2007: 66). At this point, we may consider C-T, which is thought to be able to link the psychological and social perspectives on SLA into a single framework, as mentioned previously, as a potentially suitable approach. But we still need to think a little more, and be cautious about how it can be integrated into LLS research. This discussion of its possibilities will start from an overview of the development of C-T.

Complexity Theory (C-T)

Complexity theory (C-T) is developed from complexity science in the late 20 century. Complexity science concerns issues and phenomena in complex systems, which emerge in nonlinear and uncertain fashion from constant interactions between large numbers of components or agents. Complexity science holds the idea that universe, nature and human society are full of these complex systems that cannot be precisely calculated or predicted. So complexity science takes a different world view and thinking pattern from the reductionism and determinism underlying the classic scientific paradigm developed since Isaac Newton. It rejects the traditional scientific approach that analyzes the objects into their components and studies them individually; rather it considers the synthesis of emergent wholes from studying the interactions of the individual components (Larsen-Freeman, 2002: 38).

Today complex science is widely seen as a new generation of systems science, which is the interdisciplinary study of systems in general with systems thinking rather than reductionism and determinism thinking. The history of systems science research can be traced back to the 1940s and 1950s. By then, the discovery of the phenomenon of sensitivity to initial conditions by the French mathematician H. Poincare from the 'three body problem' in the late 19th century, and the introduction of the 'uncertainty principle' by W. Heisenberg into quantum physics had initiated the earliest challenges to the certainty and predictability of physic world in people's mind. The invention of computer in the 1940s provided scientists with a powerful tool for

calculation, and thus catalyzed systematic studies on uncertain and unpredictable phenomena from a holistic and relative perspective. A few theories were subsequently developed during the 1940s and 1950s, which include the cybernetics by N. Wiener, the general system theory by L. V. Bertalanffy and the information theory by C. E. Shannon. They represent the branches of the first generation of systems science. The following two decades witnessed the emergence of several other theories and developments from systems science, which include the synergetics by H. Haken, the dissipative structure theory by I. Prigogine, the catastrophe theory by R. Thom, as well as the systematical research on non-linear phenomena such as the research on chaos by E. Lorenz and the exploration of fractal by B. Mandelbrot. These theories and branches are considered as the second generation of systems science development, and are sometimes generalized by the term 'self-organization theories/studies'.

Since the 1980s systems science has evolved into its third generation. This is the stage that the term 'complexity science' is referred to. It came as a broader framework by integrating the fundamental theoretical findings in the previous two generations, and new significant theories have been developed on the basis of this integration. Current complex science research mainly consists of five main branches, which take the bases on five theories correspondingly: emergence theory, complex adaptive system theory (CAS), evolutionary computation theory, self-organized criticality theory (SOC) and complex networks theory; these theories are five main perspectives in current complex systems research.

Although with different foci, theories derived from complexity science all recognize a series of common features shared by complex systems. The most significant ones are dynamicity, complexity, non-linearity, chaos, unpredictability, sensitivity to initial conditions, openness, self-organizing, feedback-sensitivity, and adaptability.

SLA and L2 education research from the complexity perspective

In the past three decades the scope of complexity studies has been expanded from natural sciences to social sciences; C-T has been applied to various research fields such as biology, geography, economics, medicine, education. It has also been attracting attention from the SLA and L2 education research field. It should be noted that different researchers of SLA and L2 education research field may have tended to adopt such different terms as complexity

theory, chaos theory or dynamic systems theory interchangeably in their own works, we consider all of them as the applications of C-T, as those different terms and theories have actually been integrated into what is now called as complexity science as a broader system.

Larsen-Freeman's article published in 1997, "Chaos/Complexity Science and Second Language Acquisition", is usually seen as the ground-breaking work on the application of C-T in SLA research. According to the author, language, where such characteristics as dynamicity, complexity, sensitivity to initial condition and fractal can be found, is a complex and nonlinear system. Such parallels can also be found between complex nonlinear systems and SLA by inspecting the evolutionary process of the interlanguage in the learner. The author concludes that the adoption of C-T perspective may be able to shed new light on a series of significant issues in the field.

The first decade of the 21st century witnessed an increasing popularity of C-T in the SLA and L2 education fields with both pedagogical and theoretical intents. A few years after Larsen-Freeman made her voice, some other researchers began to adopt the C-T perspective in examining issues in SLA and L2 education and found it constructive. For example, Finch (2001, 2004) make attempts to view the second language classroom from the C-T perspective, and find that it is a complex, dynamic and open system. With this conceptualization, he advocates a redefinition of teacher-student relationship, the teacher's responsibilities, and teaching approach that are able to accommodate the complexity in the L2 classroom, and calls for more qualitative action research projects to identify the complexity in the L2 classroom environment.

On the other hand, with humanistic concerns in education, Conlon (2004) criticizes the dominance of determinist-based Western teaching theories and models in Asia, and argues for a shift in teachers/teacher educators' thinking pattern for recognizing the realities of the Asian L2 classroom in both terms of sociocultural background and language learning process. With reference to chaos theory, the author demonstrates the hidden forces of chaos and self-organizing in the operations of the brain, the language, the course designer, the teacher, the student and the syllabus as interrelated individual micro-systems of the classroom ecology, and puts forward the idea that L2 theory and syllabus should aim at enabling the students to create harmony with the classroom ecology, and follow the flows of the chaotic and self-organizing

forces in creative ways that will lead to effective learning. Implications for specific practices in the aspects of teaching/learning materials development, the student's role, the teacher's role, testing and classroom research are also given.

The works of the above two researchers, who are interestingly both based in Asian contexts of L2 education (Korea and Thailand), represent the earliest attempts in examining issues of L2 education with C-T; they exhibit the possibility of the application of C-T to the L2 classroom practices.

Meanwhile, some researchers tended to work from a more theoretical perspective. Influenced by the works of Larsen-Freeman (1997, 2002) and the psychologist Van Geert (e.g. Van Geert, 1991; 1994), who had applied the dynamic systems perspective to inspecting cognition and L1 development since the early 1990s, a group of applied linguists, who mainly included K. de Bot, W. Lowie and M. Verspoor, came up with a series of publications (e.g. Verspoor, de Bot and Lowie, 2004; de Bot, Lowie and Verspoor, 2005a, 2005b; de Bot and Makoni, 2005) regarding the dynamics in various aspects of language with reference to dynamic system theory (DST). In a later paper, de Bot, Lowie and Verspoor (2007) further systematically demonstrate the characteristics of dynamicity and complexity in language and the L1 and L2 developmental processes with a primary focus on the aspect of cognition. What makes it significantly different from their earlier works as well as Larsen-Freeman's is that findings from a number of empirical studies on L1 and L2 developments are exhibited to support the arguments. Similar to Larsen-Freeman, the authors lastly call for the application of DST in further SLA research.

In the mean time, advances of C-T are introduced to deepen the research of this line. In 2006, *Applied Linguistics* made a special issue under the theme of language emergence. In the introductory section, Ellis and Larsen-Freeman (2006) note that the emergence theory of C-T will shed light on interpreting the characteristics of language as a complex system at both phylogenetic and ontogenic dimensions. A fundamental idea inspired by this conceptualization is that language acquisition and use have a mutually affecting interrelationship.

This special issue includes papers regarding specific SLA issues by various researchers with this emergentist view. Ellis (2008) steps further and gives a

more detailed account of the emergentist mechanism that functions in forming the causal relationships of language use, language change and language learning as a cycle in language communities. Based on the above findings, a year later a group of linguists naming themselves as the 'Five Grace Group' (2009) introduce to the field another theory of C-T, namely the complex adaptive system theory. They point out that the dynamically emerging cycles of language use, language change and language learning are processes of language as a complex adaptive system (CAS); this conceptualization of language as CAS can help understand language change at all levels and guide further research and theory.

It is also worth mentioning that in 2008 *Complex Systems and Applied Linguistics* co-authored by Larsen-Freeman and Cameron is published. This is the first book ever regarding the application of C-T in Applied Linguistics. It gives a detailed introduction of C-T, illustrates the complexity systems existing in such areas as language evolution, LI and L2 development and language education, and lastly provides suggestions in researching complex systems in applied linguistics.

A few recent papers indicate that C-T has gradually been applied to interpreting more specific issues in L2 education. For example, Finch (2010) applies the concept of 'sensitivity to initial conditions' to investigate the influences that critical incidents in students' past life and learning experiences will shed on their subsequent L2 learning; Ahmadi (2011) applies the principle of 'sensitivity to initial conditions' to L2 testing research and examines the effect of changing the item order of a grammar test on students' performances; Burns and Knox (2011) adopt the concept of CAS to re-interpret the data from a qualitative research on two student teachers' teaching and propose a relational model of L2 classroom, which considers L2 classroom as a complex adaptive system.

Above is a sketch of the literature on the application of C-T to SLA written in English. This is not the whole, as C-T has also been receiving attention from non-English academia. As far as we are concerned, a school of linguistic researchers in Chinese mainland, mostly taking the base of China Minzu University, have been using a chaos approach to studying various linguistic issues in China under the name of cultural linguistics since the late 1990s. Issues in SLA and L2 education as part of applied linguistics are also covered in their research scope. Researchers of this school have organized a series of

annual conferences, and important papers have been collected in a series of edited volumes with the title of 混沌学与语言文化研究 (*Chaos and Studies on Language and Culture*).

From the above discussion we can see that C-T and its usefulness for applied linguistics research have been receiving more and more attention from around the world in the past one and a half decade. Although doubts and debates (e.g. Hill, 2003; Swan, 2004) once emerged, the increasing amounts of publications and applications show that its value is getting widely recognized and realized in the field.

A Pilot Study

As our discussion comes to this point, it has become more clear that C-T also has the potential for benefiting LLS research. The underlying assumption is that the L2 learner's LLS use is also a complex and dynamic system, as he/she has to use various strategies to deal with different resources at both psychological and sociocultural levels, which include learning materials, social resources, the learner's past experiences, emotions and current L2 proficiency, etc. All these elements are evolutionary in themselves and interdependent on the others; the use of strategy is thus evolutionary and interdependent with those elements.

In order to verify this assumption a pilot study was conducted. We revisited the data from Huang's (2011) research project with reference to C-T. This project was to investigate how contextual and individual factors had influenced the researcher-and-learner in his use of strategy for learning Thai independently for three months in Bangkok. The learner kept a diary on daily basis to record the learning, and adopted SILL to record the frequencies of the use of different strategies in every four months as a different phase of learning. The discrepancies in the results of SILL administered at the three different phases indicate the changes in the frequencies of different strategies used throughout the learning period. By analyzing the diary content, the researcher identified different types of learning activities and the learning strategies involved in each type of activity, and further uncovered the social factors and individual factors in driving the learner's use of various strategies in the constructions and adjustments of different activities across time.

Our review mainly focused on the learning activities identified from the diary content. The diary kept a detailed record of the learning process. The learner was an experienced language learner and had spent one month in learning some basics of Thai independently one year ago in China before he left for Thailand. Since then he had not picked up much Thai and seen no significant progress until he started learning intensively again for this project. The learning activities recorded in the diary were categorized according to three types of resources involved, which were material resources, social resources and self as a resource. The activities with material resources included 'read (text)book', 'listen to audio materials accompanied by book', 'listen to song', 'watch MTV Karaoke', 'watch TV/drama/movie', 'listen to the radio', 'read product label or signboard', 'look for learning material on the internet', 'use the dictionary', 'read music magazine', and 'read grammar book'; the ones with social materials included 'talk with Kheem (who was a Thai friend made outside the campus)', 'socialize with Pat (who was a student fellow)', 'socialize with Toon (who was a student fellow)', 'talk with Dr. Pimporn (who was the learner's master's thesis supervisor, a Thai)', 'talk with Taxi or motortaxi driver', 'talk with Toon's family', 'socialize with Pat's friends', 'listen to people talking around', 'ask two girls for direction', 'talk with a saleslady', and 'talk with A Hua (who is a student fellow)'; the ones with self as a resource were 'keep the diary', 'think of words while trying to sleep' and 'murmur to self'.

The research found that the frequencies of the use of the activities found in the learning were different. In overall sense, the most often used activities were 'read (text)book', 'listen to audio materials accompanied by book', 'listen to song', 'watch MTV Karaoke', 'watch TV/drama/movie', 'use the dictionary', and 'talk with Kheem', whereas some of the others, such as 'listen to the radio', 'look for learning material on the internet', 'ask two girls for direction' and 'talk with a saleslady' were far less or only once mentioned. Meanwhile, as the learning proceeded the frequency and/or usage of a certain activity was not fixed but tended to change. For example, 'read (text)book' was conducted frequently since the first week; it became more frequent since the forth week but gradually decreased since the ninth week; 'watch TV/drama/movie' was scarcely applied in the first four weeks but substantially increased from the fifth to the eighth week and appeared almost every day since the ninth week; the dictionary was used in the second and third week as a 'medium' for the learner and Kheem to find topics to talk but in the fifth, sixth and seventh weeks it was used to look up the important

words and stems of word that he encountered in other activities and in the following two weeks as a main source for collecting vocabulary that he thought necessary to learn. Furthermore, different phases of the learning period involved different kinds of combination of strategies. For example, while in China, the learner used only textbooks and audio materials to learn Thai but in those three months in Thailand a much larger variety of resources were involved. More specifically speaking, the learner mainly used 'read (text)book', 'listen to audio materials accompanied by book', 'listen to song', 'watch MTV Karaoke' and 'talk with Kheem' from week one to five; then from week six to eight, he placed more emphasis on 'read (text)book', 'listen to audio materials accompanied by book' and 'watch TV/drama/movie'; in the last few weeks, however, 'watch TV/drama/movie', 'talk with Kheem' and 'use the dictionary' were considered as most important. These features show that the learning was an evolutionary process with different (combinations of) activities emerging from different stages of learning.

The diary content further revealed that the evolution of the learning was not autonomous but driven by constant interactions between various contextual (e.g. historical, social, cultural, political, economic, material) factors and various elements (e.g. cognitive, affective, experiential factors or conditions) underlying the learner's individual agency. Each learning activity was a result of the learner's strategic choice shaped by the interactions between the context and his individual agency. Context contained potential resources, but meanwhile imposed restrictions on the learner in acquiring or taking advantage of the resources in some way. The learning was a process that emerged from the learner's conscious or subconscious evaluation of and compromise between the advantages and disadvantages of resources, which were associated with a variety of factors.

It should be noted that the learner did not have any idea of C-T during the research, and nothing about C-T was mentioned in the diary. This was a natural process of learning to the learner. However, after a review of this evolutionary learning process, we could find a series of significant features of the learner's strategy use echoing C-T. The learner's strategy use was **complex**, as it was affected by various material, social, cultural, political, historical, economic, cognitive, affective, physical factors internal and external of the learner. The strategy use was **adaptive**, as it was frequently adjusted in response to the learner's evaluation and assumption of situation

through **feedback** from experience. Positive feedback would reinforce the learner's motivation to continue a corresponding effort whereas **negative feedback** would drive the learner to make adjustment. This constant adaptation reflects the **dynamicity** of strategy use, which was brought about through its **openness** to the dynamicity of context. This process of dynamic adaptation to the complex context results in **non-linearity** of strategy use.

In addition, the above features could be found in the strategy use functioning at different levels of the language learning hierarchy. They were found at the psycholinguistic processing level, at learning activity level, and at activity chain level. These levels are seen as the subsystems constituting the overall strategy use systems. In the C-T terms, they are **fractals**, exhibiting self-similarity among each other and to the overall system.

This pilot study indicates that the L2 learner's strategy use is a complex system evolving under the influence of its context. With qualitative data the features of complex system in strategy use can be captured. As such the Chinese students' strategy use can also be studied from the C-T perspective, which will provide us with insights in understanding LLS in a more fundamental sense.

An integration of C-T and LLS research

After an overview of C-T and a pilot study, we become more confident about the usefulness of C-T for the study proposed here. In previous section we mentioned the fuzziness in the terminology and definition of LLS. But as Confucius says, 'if names be not correct, language is not in accordance with the truth of things; if language be not in accordance with the truth of things, affairs cannot be carried on to success'. Now in the light of ecologism and C-T, we shall look back at the LLS research literature again. With reference to C-T we are able to judge more reasonably among different terminologies and definitions. In the following we would like to demonstrate an LLS model that we consider as compatible with the C-T view of L2 learning.

Oxford (2011) presents an updated conceptual model of LLS, which she terms as Strategic Self-Regulation (S²R) Model of language learning. This model is based on the idea that strategies are used for learner's self-regulation in L2 learning. As such, 'learners actively and constructively use strategies to manage their own learning' (Oxford, 2011). Along with the model Oxford

puts forth a whole new set of terminology, definition and classification of strategy.

Terminology

For this model Oxford applies 'language learning strategy' or 'L2 learning strategy' as the term. As mentioned earlier most researchers of this field have come to an agreement that language learner strategy, rather than language learning strategy, is a more appropriate term. Oxford's maintenance (or re-adoption) of 'learning' at first glance seems to be a regression. But Oxford herself voices the reason:

First, the focus here is on strategies for learning, although communication often occurs at the same time. People often learn as they communicate and vice versa. Second, learning-focused researchers in virtually all other fields employ the term learning strategies (Oxford, 2011: 13).

It is particularly the first reason that we consider as most significant. 'Learning' here is not considered as the isolated process of L2 acquisition as opposed to L2 communication, but as a term of broader connotation encompassing the two. 'Knowledge is the beginning of practice and practice is the completion of knowledge.' This is a famous educational idea put forward by Wang Yangming, a great ancient Chinese philosopher. It also holds true for L2 learning, echoing the 'learning in use' view of L2 development from the C-T perspective, as Larsen-Freeman and Cameron state:

Learning is not the taking in of linguistic forms by learners, but the constant adaptation of their linguistic resources in the service of meaning making in response to the affordances that emerge in the communicative situation. (2008: 135)

In this sense, the term 'language learning strategy' means an inclusion of the strategies for L2 acquisition and for communication as well. This reflects an ecological view of L2 learning, and compatible with complexity approach's 'learning in use' view of L2 education. In addition, as Larsen-Freeman and Cameron (2008) further indicate, L2 learning is to manage the dynamics of learning, and the student is, assisted by the teacher if necessary, to learn in a way that is consonant with his/her learning process. As such, any pedagogical approach, whether to the teacher or student, should be *learning-*

centered, rather than curriculum-centered or learner-centered. This echoes what Oxford means by stressing self-regulation in learning, as that is the process to manage the dynamics and create consonance in learning, where development occurs. The emphasis on learning-centeredness reminds us that it is neither learner nor the target language but *development* occurring from the interactions between the learner and the target language is the center, and this is another key point the 'learning' in the terminology 'language learning strategy' makes.

Definition

In terms of the S²R model Oxford defines L2 learning strategy as follows:

'Self-regulated L2 learning strategies are defined as deliberate, goal-directed attempts to manage and control efforts to learn the L2' (Oxford, 2011: 12)

We think this definition reflects a more advanced understanding of L2 strategy. A new synonym 'attempt', instead of the others used previously, is put forward. 'Attempt' is not explicit or tangible pattern as those adopted by other researchers previously such as 'behavior', 'technique' and 'action'; it refers to a property that lies in function or purpose, which is abstract. This can be further explained by the term 'tactics' that Oxford induces into the model to contrast 'strategy'. In her idea, tactics are specific manifestations of a strategy by a particular learner in a given setting for a certain purpose. As such, they are specific manifestations to embody the attempts as strategies. In other words, a strategy means a function by which some learning outcome will be achieved, whereas tactics are the forms to realize the function. Thus strategy is fixed, and tactics are creative and modifiable; strategy use is the process where tactics are deployed to realize the function so as to produce learning results. This function and form distinction of strategy use is significant, as it 'helps reduce the imprecision that has dogged prior strategy models' (Oxford, 2011:31), and supports us in investigating, comparing and regulating L2 learners' specific actions (which are 'tactics') taken in different sociocultural contexts or particular settings to realize certain learning achievement (which are 'strategies').

Classification

Oxford's S²R model provides a new classification of LLS reflecting an integration of the psychological and sociocultural views of L2 learning. It includes strategies of three categories: the cognitive, the affective and the sociocultural-interactive (SI). Cognitive and affective categories come from the psychological dimension while SI category refers to the sociocultural part. The SI category includes strategies used to deal with both specific social interactions and more general aspects like culture and social identity, reflecting a more updated understanding of L2 learning at the social dimension.

The model also includes 'metastrategies', which refers to crucial mental processes or tools that help the learner control and manage the use of cognitive, affective and sociocultural-interactive (Oxford, 2011: 15). So accordingly there are meta-cognitive strategies, meta-affective strategies and sociocultural-interactive strategies. The concept of 'metastrategy' is an extension of 'metacognitive strategy' that has been widely recognized in the literature; it reflects a conceptualization of the multidimensional reality of L2 learner (Oxford, 2011: 17),

The above discussion indicates that Oxford's terminology, definition and classification of L2 strategy for the S²R model is based on an ecological conceptualization of L2 learning, and compatible with the complexity approach. Therefore, the S²R model can be adopted as the L2 strategy model for the study, and integrated with the C-T approach to study the Chinese overseas students' strategy use at AU. Then we can further consider specific research methodology for data collection.

Methodology

This study expects to explore the Chinese students' LLS use at the multilingual and multicultural environment of AU, Thailand with an ecological and C-T perspective on L2. Adopting an ecological perspective requires us to look at the reality, to consider what reality (i.e. the context) means to the different participants involved, and how these various understandings influence participants' choices and decisions (Tudor, 2003). Earlier presented pilot study has also indicated the usefulness of qualitative tools in recording the complexity and dynamics of strategy use process. Thus

we suggest an qualitative approach for the data collection. Here ethnography in particular can be adopted. Ethnography means the study of an intact cultural group in its own setting (Oxford, 2011). The researcher participates in that natural setting, and studies the cultural group for a long period by using extensive fieldwork, in which multiple forms of data are gathered. This approach can provide a holistic, complex view on various aspects of the cultural group's experience. By the same token, the researcher for this study can participate in a group of Chinese student's life and learning at AU, and data can be gathered with various specific methods and instruments, such as interview, classroom observation, out-of-classroom observation, on-line conversation, students' diaries/(micro)blog texts, and a researcher's journal.

Interviews can be designed in the form of a semi-structured narrative one. Narrative can get the participants to tell their own stories and share their deepest feelings, thoughts and experiences (Oxford, 2011, in quoting Josselson, 1995). Interview designed with semi-structure will ensure rich interactions and personalized responses, and meanwhile retain focus on the topic. Interview can be conducted twice, with the first time on the students' arrival at AU, and the second time at the end of a certain period of learning. Interview questions should be carefully developed piloted and revised before officially put into use.

Classroom observation can develop the researcher's insight into the student participants' classroom ecology, whereas out-of-classroom observation can record the ecology of learning by expanding the vision to their living experience at AU, via the researcher's formal or informal, planned or unplanned contacts with the student participants in various settings. These out-of-classroom communications between researcher and student participants may also be complemented by on-line conversations with the use of such chatting softwares as Facebook, MSN and QQ, which will enable communication to go beyond the limits of time and particularly space. In addition, the researcher should collect their diaries if there are any, as it is valuable in revealing what is significant to the learners that may be inaccessible through other research techniques (Cohen, 1998). Perhaps today few students have a habit of keeping a diary regularly, but on the other hand writing on-line (micro)blog texts have become a fashion and this can be included to be an alternative to get insights into the feelings caused by significant incidents in students' lives.

Concluding remarks

In this article, we have been showing concern for the Chinese students who are pursuing educational achievements in Asia, which is an educational context that has not received adequate attention from global research field. We propose a research project to look at the students' use of strategy for English learning and use, so that we can better understand how (well) they would accommodate themselves to the environment, and thereby provide assistance to help them achieve the value of education to benefit their future life. But on the other hand, we are also looking forward to seeing similar concerns paid to the students from other countries, and/or in other contexts of education that have not received adequate attention either, such as those of South America, Africa and Middle East. This diversity will build up the ecology of research.

To rap up this article we would like to quote a remarks of the French philosopher and educator Edgar Morin, which we think can best summarize the spirit we are trying to convey through this article to anyone who would like our world to become better through education.

Understanding is both the means and end of human communication. Our planet needs mutual understanding in all directions. Given the importance of education for understanding, on all educational levels and for all ages, the development of understanding demands a planetary reform of mentalities: this is a task for education of the future (Morin, 1999).

The education on ecology, complexity and strategy, we believe, are essential to this reform of mentalities that aims at enabling us as people from different cultural backgrounds to increase mutural understanding in global communications today.

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