

Technologies Assisting Second Language Reading Comprehension: The Application of the “Advance Organizer”

By Yuanmin Gao

As Al-Segheyer (2001) says, "In the realm of second language acquisition, the most recent effort to enhance the process of language learning has involved computer technology" which is "referred to as CALL" (Computer-Assisted Language Learning). E-mail and chat rooms are the most widely used computer-mediated communication forms for language learners to connect with native speakers. Networks have provided broader range of accessibility to collaboration, mutual proofing and shared writing. Internet offers all kinds of texts, esp. authentic texts to language learners in web-format, PDF versions, or in electronic book format, etc. Even though the field is young, it is more and more used as an essential component in language teaching and learning because computers seem to be capable of performing multiple tasks. Therefore, exploring the potential and modes of enhancing language learning with different media types has received great attention in recent years. An area of this is the impact of different modes and media on reading comprehension. In facilitating L2 reading comprehension, sound, pictures, animated pictures and video can enhance vocabulary acquisition and overall text comprehension (Chun & Plass, 1996a, 1996b, 1997; Hanley, Herron & Cole, 1995; Omaggio, 1979).

A variety of tools in assisting Chinese L2 and FL reading comprehension, such as different online dictionaries, are on the market. Among them, Wenlin is one of the most versatile. Its "instant look-up" gives you the ability to look up any word or character in any Chinese electronic text simply by pointing to it. You can look up words and characters by pronunciation (pinyin), by handwriting recognition, by stroke count, and by components (or radicals). In this case, it still cannot meet the demand

of providing readers with the necessary background knowledge which is very important for assisting reading comprehension. However, readers need to activate prior knowledge before beginning to read because the activated knowledge facilitates the reading process (Carell, 1985, 1988) no matter the L2 readers are heritage or non-heritage. FL learners learn the language in classroom with textbooks (Kagan & Dillon, 2001). Although heritage language learners have some language background from different aspects, they are not like native speakers who learn a language in childhood and continue using it throughout life in the native language community (Kagan & Dillon, 2003). The learners of Chinese as second language have the same problems as other language learners. For example, when assigned the writing topic of “Hero of the Nation (民族英雄)”, more than 1/3 of the students of heritage intermediate class misunderstood the definition of “Hero of the Nation”. The similar cases may also happen in reading, which means background knowledge is very crucial to their reading.

I. Research review

"A variety of studies on second language reading comprehension have shown the importance of context and background knowledge in the comprehension process" (Chun & Plass, 1996b, p. 504) with the efficient tool “advanced organizer”.

The study of Ausubel (1960) proved the hypothesis that advance organizers -- the advance introduction of relevant subsuming concepts can facilitate learning and retention of unfamiliar but meaningful verbal materials. The following research of Ausubel and Fitzgerald (1961) confirms that related concepts are significantly effective. A number of other studies support the value of advance organizers, especially the role of visual organizers.

Visual information can establish an analogy between the visual information and the corresponding mental mode, able to be directly mapped onto the mental model (Gentner, 1983; Schnotz & Grzondziel, 1996). Omaggio (1979) conducted a study to investigate the effects of pictorial context on reading comprehension in beginning college French, hypothesizing pictorial contexts as advance organizers can enhance reading comprehension. The research results show that pictures, which are helpful as the Prethematic Context visual advanced organizer, have significantly positive effect on second language text comprehension for aiding the reader in organizing his background knowledge and guessing the meaning of unfamiliar words and structures. Hadley (1993) also suggests that "the best visual context for subjects at relatively low proficiency levels is one that provides enough background knowledge to aid them in finding an appropriate overall scheme for comprehending the story, providing cues to the general nature of the passage as a whole without being confusing" (p. 144). Hadley (2001) reemphasizes "pictorial organizers are particularly helpful to students at the lower levels of proficiency and may enhance comprehension most for beginning and intermediate learners" in her revised edition of the same book (p. 151). In a similar experiment with adult ESL students, Hudson (1982) found that visual advance organizer leads to more effective externally induced schemata in comprehension to lower and intermediate level L2 readers. The study of Taglieber *et. al* (1988) explored the effects of three prereading activities -- pictorial context, vocabulary preteaching and prequestioning on reading comprehension with 40 university Brazilian EFL students. The results of open-ended test and multiple-choice test revealed that pictorial context and prequestioning strategies are more effective than vocabulary preteaching and the control group, which not only proved the hypotheses of prereading activities result in higher comprehension scores, the

pictorial context condition also added weight to Hudson's conclusion. Peek (1993) also suggests that visual aids may be able to help poor readers building mental representations based on the text.

Other studies demonstrate that video can function as a successful advance organizer in reading comprehension. Sherwood, Hasselbring & Bransford (1987) explored how video-based technologies create macro-contexts that can facilitate L1 reading comprehension. The findings of their experiments show that the use of video as advance organizer that provide rich macro-contexts can increase comprehension and learning. Hanley, Herron & Cole (1995) compared the effects of two visual advance organizers -- video and *pictures + teacher narrative*, on comprehension and retention of a written passage in a foreign language. For the students in the video group, an advanced organizer was presented by a video clip while for the comparative group, was presented by 4 still pictures related in context and teacher's narration in the target language. The empirical findings of this study support the use of a video clip as an advanced organizer to introduce a reading passage: the scores for students in the video group were higher on 9 of the 12 immediate tests. The summary score (1-12) for the video group was significantly higher than that for the *pictures + teacher narration* group. The score for the video group was significantly higher on the final test than that for the comparative group. These results prove video is more effective in enhancing comprehension and aiding retention than the static pictures because of "the inherent strength of video to contextualize better than still pictures" (p. 63). This video's ability may "provide a more memorable background store of information than static pictures and a teacher narrative" (p. 63). Plass (1998) also suggests that video is a good media as visual advance organizer on reading comprehension.

The increased availability of technology makes the authentic supports for language learning possible. Hadley (2001) points out that "one of the newest resources for language teachers in providing an enriched context for learning is the computer" (p. 163). Chun and Plass (1997) demonstrate that advance organizer can help language learners to integrate new information into the existing mental model in textual form, in auditory form, in video or in any combination of these presentation modes. Frommer (1998) agrees that computers, when used appropriately, can provide meaningful context as well as background knowledge. With multisensory, multidimensional and interactive features, computers can also aid memory and cognition.

The study of Chun and Plass (1996b) investigates the effect of a dynamic visual organizer with the multimedia application CyberBush, hypothesized to aid in top-down processing at the macro-level. The results support the value of visual advance organizers as facilitators of L2 comprehension as well as "dynamic visual stimuli or forms of information might be more easily remembered and better at helping learners to build mental images" (p. 514-515). The study of Mayer and Sims (1994) also shows that multimedia has strongest positive effects on low-prior knowledge and high-spatial ability students. Plass (1998) ever states that multimedia can aid reading comprehension as an advance organizer to activate different levels of prior knowledge with its particular adaptable features.

Stepp-Greany (2002) states that internet activities can also help language learners as advance organizers as well as other features "to deconstruct texts, see relationships, and complete task-based activities" (p. 174).

The effectiveness of "advance organizer" has been proved by many researches of second language reading comprehension. Its function of providing context and

background knowledge in the comprehension process varies according to the medium used, such as preteaching, static pictures, video and multimedia. The conclusions support that dynamic visual stimuli and multimedia applied tool are more efficient to activate prior knowledge.

II. Significance to reading activities of Chinese as second language

In teaching Chinese as second language field, based on my knowledge, some schools follow the pattern of teaching English as second language, offering such courses as intensive reading, oral speaking, listening, reading, writing and other culture related ones; some others offer integrated courses which involve different language knowledge and skills according to the course content and focus. Traditional teaching method, especially intensive reading courses may make students consider traditional skill and grammar instructions more beneficial than reading. Moreover, traditional classroom activities give CSL students the impression that reading is a process of form explanation and word-by-word decoding. However, many scholars have noted that "Language is too complex to be deliberately and consciously learned one rule or one item at a time" (Krashen, 1993, p. 13-14) because vocabulary teaching methods typically cover simple synonyms, and only give part of the meaning of the word with none of its social meanings or grammatical properties (Krashen, 1993, p. 15). Educational administrative authority has noticed the problem of teaching Chinese as native language. In recent years, Chinese course syllabus and textbooks are revised with more reading material resources, for they may also realize "The cure for this crisis is: reading" (Krashen, 1993, p. 1) because reading develops better reading comprehension, good writing style, adequate vocabulary, advanced grammar and good spelling (Krashen, 1993). That appears more important to TCSL; due to the

low literacy levels of most of the learners, one of the principal objectives of teaching is to help students establish their language competence of reading and writing.

Chinese is a very complex language with various language usages, writing styles as well as prominently rich historical and cultural background. That may bring about more difficulties to readers as second language. Advance organizer is a good tool to facilitate students' reading with background information. For example, when reading idiomatic stories, more than one student are likely to misunderstand their implications. According to my experience, when students read the story "Blind imitation with ludicrous effect" (*Dong shi xiao pin*), they mistakenly extend the beauty of the heroine *Xi shi* to her internal virtue. These extensions are against the common beliefs because for many centuries in Chinese culture, no record regards her as a patriot. In this case, if some cultural background information is provided beforehand, students' reading comprehension would be more accurate. Because China has a long history compared with many other countries, in Chinese reading if more background information about culture, history, theme, figures, etc. is provided, less misunderstanding will be brought about.

Based on the research results, advance organizer with technological media works much better than paper based background introduction. Therefore, multimedia programs should be more helpful than traditional background presentation in classroom. Out-of-school reading relies on more technical aids because it is harder for autonomous readers to get the background information, especially for second language learners.

III. Potentialities in practice

When the topic of practice is encountered, we can consider it from different angles, such as writing styles, etc. Writing styles can be considered as one factor to

guide integrating advance organizer into reading activity. For example, as far as reading news articles is concerned, the background information of the topic should be provided. If the topic of Hong Kong issue is touched (p. 38 of Chinese Breakthrough, U1L4 “China and Great Britain Hold Sixth Round of Talks on the Issue of Hong Kong” 中英就香港问题举行第六轮会谈), the historical and current background of the relationship between Mainland China and Hong Kong should be presented. Although this example is out of date, that can be applied to current Taiwan topic. If the sports topic is accessed (p. 153 “Chinese Athletes Win More Gold Medals at the Paralympic Games” 中国运动员在残疾人奥运会上再夺金牌), the background knowledge of the sports event needs to be supplied.

When popular literature reading materials are reached, not only the historical and cultural background but also the main characters and a hint of the plot (but not the ending) should be offered. That will entice students to want to know more about the books.

Background knowledge will ease students into the reading materials and make reading – especially the first 20 pages for novels in which new characters, settings, and story lines are introduced – more enjoyable, for that sometimes can build a bridge between the reading material and the readers’ mental mode, such as a passage in another book, a story they heard, a film, or video they had seen or, something relevant to their own experiences.

Of course, all the background knowledge will be provided as advance organizer with different technological media. Some styles or topics need video format, others need multimedia. How much and how media is integrated to the background introduction depend on readers’ need, developers’ capabilities and technology accessibilities.

IV. Limitation and problems

Some people think that technology and multi/new media are a panacea in education, L2 education included. However, any kinds of the technologies have their own limitations and problems.

1. Need analysis is hard to be carried out for different reading materials and to different users.
2. Absence of real-time, face-to-face interaction: learners cannot benefit from classroom teacher - the most reliable source in local circumstances, the major source of native L2 input and synchronous guidance and feedback.
3. Technological problems frustrate users and poorly-designed electronic help causes user confusion.
4. The last problem is the most critical one. As a tradition, most of the time technical problems are inclined to be noticed and paid much more attention than conception. When I did a personal interview with an instructional designer and developer, he raised the question – whether we should treat technology as just a tool or we should involve it in our teaching as a necessary element rather than an aid. If we like to accept the new concept, the next thing is how can we make it possible?

Conclusion

“Zhang Zhigong (张志公) once said: ‘Reading is not just learning and transmitting knowledge from the predecessor and others. It also influences the productivity, life, and the development of science and technology in the contemporary and future human society.’” (Zeng & Han, 1992). “‘Reading’ used to be the most basic method of knowledge acquisition. In the new era’s growth of knowledge and economy, it should still be the indispensable way of spreading human culture” (Gan,

2001). Designing and developing facilitator such as advance organizer with technological media is very necessary to aid reading activities and very significant to acquiring knowledge and spreading culture. However, this field of both theoretical research and practice is really new in TCSL. How to make it work will depends on more efforts of need analysis and users' feedback.

Reference

- Al-Seghayer, K. (2001). The effects of multimedia annotation modes on L2 vocabulary acquisition: A comparative study. *Language Learning & Technology*, 5 (1), 202-232.
- Ausubel, D. P. (1960) The use of advance organizers in the learning and retention of meaningful verbal material. *Journal of Educational Psychology*, 51(5), 267-272.
- Ausubel, D. P., Fitzgerald, D. (1961). The role of discriminability in meaningful verbal learning and retention. *Journal of Educational Psychology*, 52 (5), 266-274.
- Carrell, P. L. (1985). Facilitating ESL reading by teaching text structure. *TESOL Quarterly*, 19 (4), 727-752.
- Carrell, P. L. (1988). Text-boundedness and schema interference. In P. L. Carrell, J. Devine, & D. E. Eskey (Eds.), *Interactive approaches to second language reading*, (pp. 101-113). Cambridge: Cambridge University Press.
- Chun, D., & Plass, J. (1996a). Effects of multimedia annotations on vocabulary acquisition. *The Modern Language Journal*, 80 (2), 183-198.
- Chun, D. M., & Plass, J. L. (1996b). Facilitating reading comprehension with multimedia. *System*, 24 (4), 503-519.
- Chun, D., & Plass, J. (1997). Research on text comprehension in multimedia environments. *Language Learning & Technology*, 1 (1), 60-81.
- Frommer (1998)
- Gan, Qixun (2001). Wei yue du zheng ming [Justify reading]. *Teaching Reference of Secondary School*, 1-2, 8.
- Gentner, D. (1983). Structure-mapping: A theoretical framework for analogy. *Cognitive Science*, 7, 155-170.
- Hadley, A. G. (1993). *Teaching Language in Context*. Boston, MA: Heinle & Heinle.

Hadley, A. G. (2001). *Teaching Language in Context*. Boston, MA: Heinle & Heinle.

Hanley, J., Herron, C. & Cole, S. (1995). Using video as an advance organizer to a written passage in the FLES classroom. *The Modern Language Journal*, 79 (1), 57-66.

Hudson, T. (1982). The effects of induced shemata on the "short circuit" in L2 reading: Non-decoding factors in L2 reading performance. *Language Learning*, 32, 1-31.

Kagan, O. & Dillon, K. (2001). A new perspective on teaching Russian: Focus on the heritage learner. *Slavic and East European Journal*, 45(3), 507-18.

Kagan, O. & Dillon, K. (2003). A new perspective on teaching Russian: Focus on the heritage learner. *Heritage language journal*, 1. <http://www.heritagelanguages.org>

Krashen, S. (1993). *The Power of Reading*. Englewood, CO: Libraries Unlimited.

Mayer, E., & Sims, K. (1994). For whom is a picture worth a thousand words? Extensions of a dual-coding theory of multimedia learning. *Journal of Educational Psychology*, 86 (3), 389-401.

Omaggio, A. C. (1979). Pictures & second language comprehension: Do they help? *Foreign Language Annals*, 12, 107-116.

Peek, J. (1993). Increasing picture effects in learning from illustrated text. *Learning and Instruction*, 3, 227-238.

Plass, J. L. (1998). Design and evaluation of the user interface of foreign language multimedia software: A cognitive approach. *Language Learning & Technology*, 2 (1), July 1998, 35-45.

Schnotz, W., & Grzondziel, H. (1996). Knowledge acquisition with static and animated pictures in computer-based learning. Paper presented at the Annual Meeting of the American Educational Research Association (AERA) in New York, April 8-12, 1996.

Sherwood, R. D., Hasselbring, T. S. & Bransford, J. D. (1987). Macro-contexts for learning: Initial findings and issues. *Applied Cognitive Psychology*, 1, 93-108.

Stepp-Greany, J. (2002). Student perceptions on language learning in a technological environment: Implications for the new millennium. *Language Learning & Technology*, 6 (1), 165-180.

Taglieber, L. K., Johnson, L. L. & Yarbrough, D. B. (1988). Effects of prereading activities on EFL reading by Brazilian College students. *TESOL Quarterly*, 22 (3), 455-472.

Zeng, X. Q. & Han, X. P. (1992). Yue Du Cong Shu *Reading Series*. Preface. Zhengzhou, Henan: Education Press of Henan