Enhancement of Reading Efficiency Using Dynamic Displaying Mode of Chunks on an Integrative Software

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ABSTRACT

In a CALL environment for Japanese EFL university students, we have long been successfully enhancing their reading efficiency, using a customized software with a dynamic display mode of chunking text. In this practice, students read silently or aloud a certain amount of passages on the software, named Mint, in each lesson. In order to assess the learning effects, we measured WPM (Words Per Minute) and comprehension rate, and gave affective questionnaires in pre- and post-tests on one semester basis sometimes without this software, and sometimes just on paper base. In these tests, however, we had difficulty measuring WPM and comprehension rate precisely, using multiple tools, tallying the data and giving a quick feedback. Eventually, last year our software was renovated to realize precise measurement of WPM and comprehension rate, and instant feedback with even a questionnaire available, as well as a security enhancement by data encryption. More importantly, this new software, named Mewm, can successfully integrate the above effect measurements and classroom practice, so that students can see their reading speed and comprehension rates not only in the pre- and post-tests but in every lesson. This integrative software can, as a pacemaker, motivate our students and facilitate their reading efficiency by self-adjusting. In this paper, reviewing the development of the application software above, and reporting our tentative educational assistance of university-level learners of English, we are going to show how our attempts to enhance reading efficiency are sustainable, while innovating the practice of an actual reading class. In the rest part of the paper, we show a study on the two-week effects of oral reading programs with both Mint and Mewm, on Japanese university learners of English. The data was found which indicate that their reading comprehension score did not improve significantly, and that their WPM did.

1.0 INTRODUCTION –WHY CHUNKS?

Since 2007, we have been trying to enhance reading efficiency (RE) of Japanese university learners of English by using fast-reading training software with a chunking text on a PC display. In

this paper, RE refers to the product of accuracy and the speed of text reading (Geva, E. & Yaghoub Zadeh 2006); it is calculated as WPM (Words per minute) multiplied by comprehension rate. Then, a chunk is considered processing unit of sound, meaning, and syntax with a duration of 2±1 sec., termed differently as BG (Breath Group), sense group or intonational phrase etc (Yubune and Tabuchi 2013). In this practice, we have segmented one chunk by approximately 5 to 7 words in each sentence. This unit enables learners to process the meaning and structure of English sentences (Ohtagaki and Ohmori 1990), not reading back and forth to translate them into the learners' native language. Other studies (Kadota 1999, Yoshida 1998) show that a display method of chunked phrases and clauses could significantly enhance reading speed. On this background, we have long focused on a chunk as a sustainable effectual factor for reading better and faster.

1.1 Dynamic Display Mode of Chunks on a Software

We have assumed that using chunked texts on a PC display would be effective for novice Japanese learners of English to improve reading; they tend to read an English sentence back and forth in order to parse it and translate it into Japanese word for word. Such a tendency may run counter to enhancement of RE, however hard they may try to read fast on paper base. On the contrary, a display-driven method has been expected to propel them to read faster. We have used a software program called *Multimedia Player Mint* (*Mint*), developed by Mint Applications Co. LTD. On the screen powered by the program, one after another underlined chunk appears with the prompter running along the text so that students can read at the speed of a native speaker's voice (**Figure 1**). This software also measures their WPM; having finished reading, students can answer the online comprehension quizzes and then receive feedback on WPM and comprehension rates

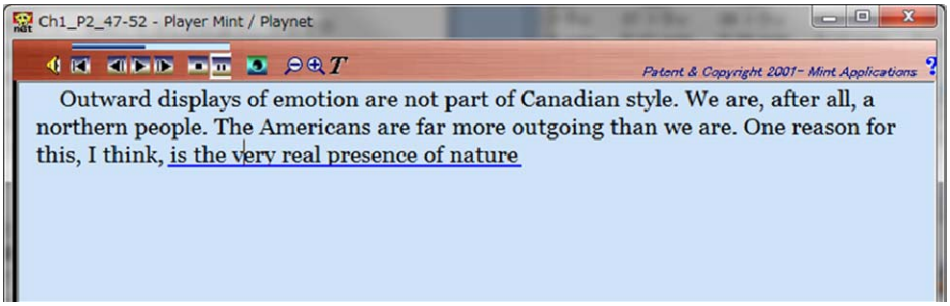

Figure. 1 One display mode where one after another chunk appears and stays there

instantly. Such feedback is expected to make students aware of their own reading speed and lead to their motivation. Aside from the above silent reading practice, in recent years, we have given students phonological-based trainings with *Mint*. The trainings include oral reading, repeating, shadowing, etc., done individually or all together in class using the above dynamic display mode of Mint. Anyway, we have long used this simple but impressive software with RE enhancement as a research purpose.

1.2 Methodology and Challenges

On the aforementioned condition, our research has been always based on the practice in actual classes. Each class has a reading activity using *Mint* once a week according to the environment and principle of the class. In order to measure the learning effects of a few months' training, we gave students pre- and post-test in one semester basis to measure WPM and comprehension rate. Each test is made up of 4 reading passages with 5 comprehension quizzes in each and 20 listening questions. The test items were all adopted from the pre-level 2 English Language Proficiency Test in Japan. The full marks for both reading and listening comprehension are 20. In passing, listening questions aimed to confirm a transfer effect of reading on listening ability. At the same time, we

gave an affective questionnaire to see changes in students' cognitive and mental attitudes toward reading.

In this way, long years of study and practice have shown that either silent or oral reading has, more or less, taken some effect on students' reading speed and efficiency as well as motivation (Yubune et al 2009, Yamaguchi 2012), except a transfer effect on listening ability.

Despite these results, we saw challenges on how we do the research. For one thing, in pre- and post tests, we had difficulty measuring WPM and comprehension rate precisely; for example, we had, at one time without Mint, at other times on paper base, used multiple tools like HTML, a stop-watch, and a bubble sheet. That made it difficult to tally the data and give a quick feedback.

For another, we may have needed more data to confirm the effect. The effect measurement for which we largely rely on pre- and post-tests had to be taken from the practice of every lesson in a classroom. In a sense, we had to integrate classroom practice and pre- and post tests. Thus there arose a need to upgrade or renovate the software for sustainable practice.

2.0 RENOVATED SOFTWARE

Mewm system has two pieces of application software, *Mewm* and *Mewm Pro*. The former is for learners to practice reading, and the latter for teachers to create a reading quiz and questionnaire. There are three steps for accurate and easy measurement: the creation of files, the measurement of reading speed and accuracy of one learner, and the summarization of all learners' data.

2.1 Step 1: Creation of Mewm Files

Teachers start *Mewm Pro* application, and insert data on passages, questions and answers into a newly created file, and they will get a *Mewm* file (**Figure 2**).

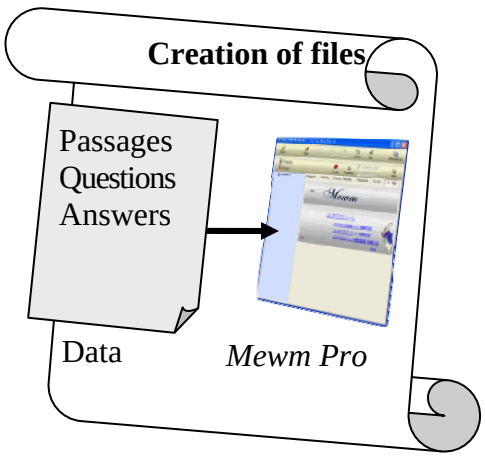

Figure 2: (1) Creation of *Mewm* files

2.2 Step 2: Measurement of Learners' Reading Speed and Accuracy

Learners get from teachers a *Mewm* file and the application *Mewm*.exe, and they drag it to the application so that a start screen will appear. On the screen they see basic precautions such as "they will have to read both speedily and accurately". Then they enter their name such as "Eiichi YUBUNE", and the first passage will appear. When they think they finish reading, they click a button, and its comprehension quiz section begins. The software records the answers they have chosen and judges whether they are correct or not, and it also watches how long it took for learners to read a passage and answer its quizzes respectively (**Figure 3**).

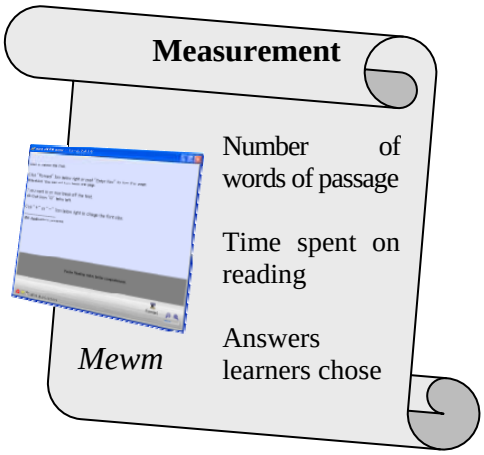

Figure 3: (2) Measurement of reading speed and accuracy

When all the questions are answered, the reading activity ends and the screen shows the result of learners' WPM and the score on the comprehension questions they have answered. The bottom line says "Your result file is 20140530095323Eiichi YUBUNE.mewmt". At this stage, learners can reflect on their own skill of reading fast and accurately. After that, they hand in their file to teachers.

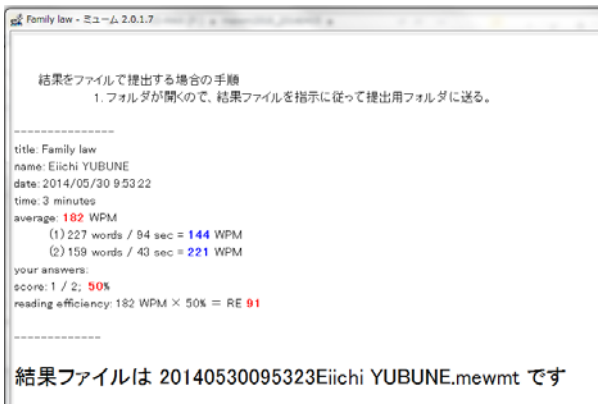

Figure 4: Personal result

2.3 Step 3: Summarization of Learners' Data

The final step, the 3rd, is for teachers and researchers as well as in the first step. They collect the files the learners have handed in (**Figure 5**).

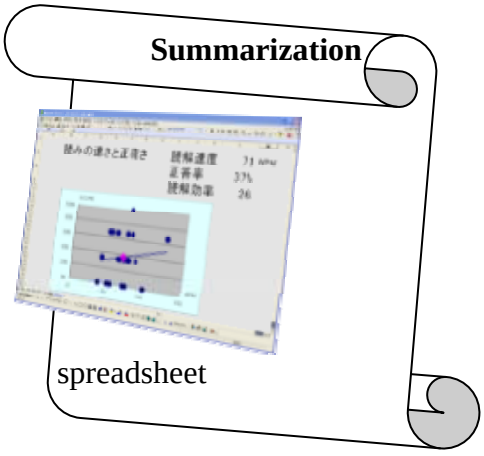

Figure 5: (3) Summarization of data

So far they have had to repeat the same number of operation as the number of learners again and again: they had to open a file about one learner, copy the information in it, and paste the data into a file run on spreadsheet software like *Microsoft Excel*, but the *Mewm* helps us overcome the prolonged bitterness of such repetition. Teachers only have to select all the files and drag them into the *Mewm Pro* application, and the application copys all the data to the clipboard, so they can paste it into a file on spreadsheet software very easily (**Figure 6**). In the figure, there is the summarized data on one reading activity including two passages and two comprehension questions. "Wrd" stands for the number of words in one passage, "rt" is the time spent on reading a passage, "scr" means score. For example, learner D's wpm 1 (211.25) is calculated according to the formula: the number of words of passage 1 (169 words) divided by "rt1" (48 seconds) times 60 equals 211.25.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	title	name	date	time	wrd1	wrd2	rt1	rt2	wpm1	wpm2	ans1	ans2	scr1	scr2
2	Intellectual property law1－1	A	2014/5/20 16:15	4.16	169	196	98	95	103.47	123.79	3	2	1	1
3	Intellectual property law1－1	B	2014/5/20 16:38	2.57	169	196	55	68	184.36	172.94	3	2	1	1
4	Intellectual property law1－1	C	2014/5/20 16:15	3.54	169	196	72	81	140.83	145.19	3	2	1	1
5	Intellectual property law1－1	D	2014/5/20 16:39	2.71	169	196	48	66	211.25	178.18	3	2	1	1
6	Intellectual property law1－1	E	2014/5/20 16:13	2.58	169	196	42	69	241.43	170.43	3	2	1	1
7	Intellectual property law1－1	F	2014/5/20 16:40	3.83	169	196	78	112	130	105	3	2	1	1
8	Intellectual property law1－1	G	2014/5/20 16:14	2	169	196	19	56	533.68	210	3	2	1	1
9	Intellectual property law1－1	H	2014/5/20 16:15	4.11	169	196	81	97	125.19	121.24	2	2	0	1
10	Intellectual property law1－1	I	2014/5/20 16:13	2.7	169	196	53	70	191.32	168	3	2	1	1
11	Intellectual property law1－1	J	2014/5/20 16:14	3.38	169	196	64	74	158.44	158.92	3	2	1	1
12	Intellectual property law1－1	K	2014/5/20 16:38	2.32	169	196	43	57	235.81	206.32	3	2	1	1
13	Intellectual property law1－1	L	2014/5/20 16:39	3.09	169	196	38	79	266.84	148.86	3	2	1	1
14	Intellectual property law1－1	M	2014/5/20 16:39	2.66	169	196	44	76	230.45	154.74	3	2	1	1
15	Intellectual property law1－1	N	2014/5/20 16:38	2.48	169	196	45	63	225.33	186.67	3	2	1	1
16	Intellectual property law1－1	O	2014/5/20 16:38	2.75	169	196	60	77	169	152.73	3	2	1	1
17	Intellectual property law1－1	P	2014/5/20 16:15	3.37	169	196	57	100	177.89	117.6	3	2	1	1
18	Intellectual property law1－1	Q	2014/5/20 16:39	3.24	169	196	62	93	163.55	126.45	3	2	1	1
19	Intellectual property law1－1	R	2014/5/20 16:15	4.05	169	196	78	86	130	136.74	2	2	0	1
20	Intellectual property law1－1	S	2014/5/20 16:39	3.14	169	196	55	77	184.36	152.73	3	2	1	1

Figure 6: Automatically summarized data

2.4 Quick Feedback of the Tendency in Class to Learners

After getting the summarized data from all the learners automatically, teachers can show, as a feedback, reading scores, WPMs, and REs in graph form by dragging and dropping the data on a programmed spreadsheet file for which they have prepared for instant feedback (**Figure 7**). By showing this, they can make students so well aware of how their performances are every time that

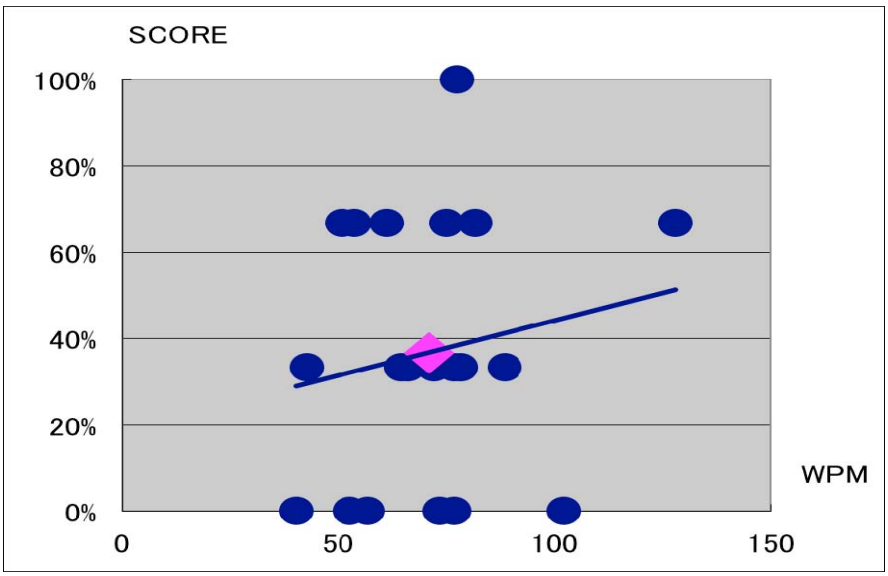

Figure 7: All learners' result at one time

they can be more self-adjusting their speed and accuracy in reading.

3.0 ONE EXAMPLE OF USE OF THE TWO SOFTWARE

In this part, we report the effects of English language training on 22 Japanese college-level learners of English whose TOEIC estimated scores are 550 to 730. In order to teach English effectively, we used the software *Mint*, and, in order to assess collect learners' data, we used *Mewm*. In the pre-test, we assessed learners' silent reading speed as well as comprehension accuracy by giving them the passages they have read in a classroom, which means that they had read them as a prior learning activity with *Mint*. They were told to read both fast and accurately. The *Mewm* watched them read passages and answer its questions and recorded the time they spent reading. Two weeks later, the same procedure was performed as a post-test, but the passages they read this time were different from the one read at the pre-test, although their topics and difficulties to read are almost the same because their MGJP scores are 15.1 and 15.0 respectively. MGJP, Mint Grade Level for Japanese, is a readability formula such as Flesch-Kinkaid, but created especially for Japanese learners of English. Each passage for one test has two paragraphs and two questions, so the full score of comprehension test is 2.

3.1 Results

As shown in Table 1, at the pre-test about half of the learners got the full score while the others one point. Their average WPM was about 129. Two week later their comprehension score did not improve statistically, but their reading speed did significantly. According to Carver (1989), teenagers whose mother tongue is English improve their reading speed by approximately 10 WPM ~~a~~ year. So the result obtained from our learning treatment is meaningful.

Table 1. Average (SD) on Comprehension scores and WPMs

	Comprehension Score	**WPM**
Pre	1.45 (.74)	129.10 (31.71)
Post	1.73 (.46)	147.42 (36.16)

4.0 CONCLUSION

We have developed the *Mewm* system and, thanks to the application, now we do not have to spend a lot of time and efforts measuring and collecting learners' data, even if their numbers of cases are more than one hundred. CALL programs are not all about language learning, but the two application programs we have mentioned in this paper have far more advantages on the automation of the measurement and the collection of learners' traces than painful, manual labours. Thus, on these technological bases, reading a chunking text can be sustainable in order to enhance reading efficiency.

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