Interactive Whiteboards and Web Tools not only Engage Learners but also Increase Reading Fluency in Japanese as a Second Language – Evidence from an Australian Primary School

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Abstract

This study was designed to assess the effectiveness of the use of Information and Communication Technology (ICT) to improve primary school students' reading fluency in a foreign language. The students participated in a series of scaffolded learning activities using an Interactive Whiteboard with a variety of Web Tools. Progress in student reading fluency was measured through direct observation, formal pre- and post- testing and the completion of a digital presentation using iPads.

All students were native English speakers who had been taught Japanese hiragana characters, and had some experience in reading individual characters and words. They participated in a variety of activities designed to increase fluency in reading words and sentences relating to transport and travel, written in hiragana. The activities primarily used the Interactive Whiteboard, interactive PowerPoint presentations and Web Tools such as Triptico and BarryFunEnglish. The students were then required to create their own presentation using the iPad app, Tellagami.

Over the course of this study, students showed significant improvement in their reading skill development. Improvements were evident in all aspects of reading skill development, including individual character, whole word and sentence recognition. However, students showed significantly greater improvement inindividual characters. Pre- and post- testing demonstrated significant progress in the students' reading skills, with a remarkable increase in the number of students who attained a perfect score in reading whole sentences - from 8% to 58% of the cohort.

Student reflections suggested that teaching whole word recognition using the Interactive Whiteboard was much more effective than individual character drills. In addition, while the scaffolding of ICT activities, in the form of Interactive Whiteboard and iPads, was a major focus, some of the most effective student learning resulted from sharing sessions with the Interactive Whiteboard as a medium through which students discussed reading strategies.

One most interesting findings in this study was that the expected increase in speed of reading to suggest improved fluency did not correlate to the increased vocabulary knowledge or reading skill development. Rather, the students reading speed decreased as they relied more on their reading skills and less on rote learning, memory and guessing.

Overall, this project revealed the value of chunking, the importance of students sharing strategies, and the need to merge both ICT and effective teaching strategies into each learning activity. While the use of ICT was an engaging methodology, it also proved to be an effective means of presenting and sharing information, of reinforcing word recognition and word/sentence order and providing a means to publicly demonstrate all aspects of Japanese character reading in a clear and tangible way which was accessible for all students. In addition, by allowing students to share their own learning techniques and strategies through the medium of the Interactive Whiteboard, they became more empowered, confident and engaged learners.

1. Introduction

Studies have shown that reading a first language (L1) is a complex process, and reading in a second language (L2) is even more so with interference from cross-linguistic and sociocultural influences and a limited vocabulary. Further, L2 readers tend to focus more on the vocabulary and grammar than on comprehension.

Defining the concept of reading fluency varies between researchers. Accuracy, automaticity and prosody are important components of reading fluency. Some researchers define fluent reading as smooth, with no hesitation but with comprehension. Others, however, claim word recognition is the first step to comprehension. There is a suggestion that in fluent readers, word recognition and comprehension occur simultaneously. For many researchers, increased speed is seen as an indicator of increased fluency. However, reading level, age and gender also affect reading fluency.

1.1 Rationale

Teachers of Japanese as a second language (L2) in Government, Catholic and Independent Primary Schools face many challenges including the range of student abilities within a class, class sizes, school culture, community support and adequate resourcing. One of the most significant challenges, however, relates to timetabling. While languages attract similar weighting to other elective subjects in most Secondary Schools, the majority of Primary Schools allocate only one 40 – 50 minute class per week to second language study.

At Gardenvale Primary School, the Japanese program has strong community support and generous resourcing but is hampered by the timetabling issue. Students from Foundation level to Year 6 attend language class once a week for a 50 minute lesson.

Despite having enthusiastic learners in a relatively positive environment for language learning, it can be challenging to move students from being capable readers of characters and words to becoming fluent readers of texts. While Vgotsky suggests that students need to be in the zone of proximal development (ZPD) for meaningful learning to occur [1], this has been challenging to incorporate into planning documents for 600 students across 7 year levels in 24 separate classes.

1.2 Investigation Outline

The first research question specifically addressed the issue of moving students from being capable readers of individual characters and words to becoming fluent readers of texts, that is, from individual word recognition to comprehending text as a whole.

The second research question focused on how to assess improvement in fluency, and was challenging given the differing definitions of fluency and how it can be assessed (e.g. speed versus comprehension). For the purpose of this study, reading fluency was defined as increased automaticity and comprehension.

In order to address these research questions, a fourteen week plan was developed which consisted of a series of scaffolded tasks designed to move students into the ZPD with a variety of supports included to realise the goals of the study. Assessments included a pre-test, a series of formative assessments and a post-test. The project concluded with individual assessment tasks using iPads to demonstrate student mastery of the macro skills of reading and speaking.

The topic chosen for this study was 'travel' and included vocabulary relating to vehicles (10 words) and places (10 words) with the sentence structure 'I go to ~ by ~.'

1.3 Scaffolded Tasks

The tasks were scaffolded to ensure students were both building on previously knowledge and being challenged academically, thus moving into the ZPD. The initial activities focused on revision of known hiragana and conventions, then moved on to word recognition and sentence construction activities which incorporated the Repeated Reading methodology [2, 3]

Pre-test

The pre-test occurred in week three of the study and included individual character, word and sentence recognition with a timed element to measure fluency.

Structure of Lessons

Each class followed a similar structure:

- Revision activity
  - use of IWB Triptico Word Magnets
- Introduction of new materials
  - vocabulary, grammar and sentence structure
  - using IWB, Triptico and PowerPoint

- Explicit teaching of new vocabulary/grammar
- Small group activity to reinforce new learning / peer learning
- Reading revision
    - using IWB and Triptico Word Magnets/word cards
    - formative assessment
- Individual activity
    - writing sentences/creating annotated map/recording tellagami
- Lesson end
    - discussion
    - revision of new learning and connections to prior learning

At the beginning of each lesson, students were asked to share reading strategies using the IWB and the Word Magnets. The strategies included:

'I listen to the sound of the first part of the word and look for that character';

'I listen to the number of syllables in the word and then work out which word has the same number of characters';

'I knew that one sound was repeated so I tried to find the word which had repeated characters';

'I remembered from last week';

'I guessed'.

1.4 Assessment

Formative Assessment

Throughout this study, there were several data points where formative assessment took place.

- Revision activities using IWB
- Sentence structure activity using word cards
- Vocabulary-swatter / karuta activity assessing student's ability to recognise several pictures and/or words when given an aural clue
- Futuba, an iPad app incorporating the vocabulary

One or more of these activities were included in each week's lesson plan, allowing on-going formative assessment of student ability throughout the ARP. This, in turn, was used to inform planning for the following week's lesson.

Summative Assessment

In week nine, students began the final assessment activity for this unit of work. The assessment activity involved three parts:

1) Students were required to create an illustrated map and include and label all of the vehicles and places on the map.
2) Using the map created, students were required to compose five structurally correct sentences that would describe a path around their map.
3) Students were asked to create a Tellagami avatar, photograph their map as the background image, and then read and record three of their sentences using the app. As the app does not allow editing, reading had to be recorded in one continuous stream.

In the final session of this project, students were asked to discuss their experiences relating to this unit of work. They were also asked to rank the activities in order of most to least helpful. The students ranked the activities as follows:

1) IWB - Triptico Magnets
2) sharing strategies - talking about how to read words
3) music/songs/raps
4) the mini books
5) playing karuta/particle races
6) using hiragana charts to read characters

2. Discussion

2.1 Pre-test Post-test Score Differences

Hiragana Recognition

Section One of the test involved recognising hiragana characters using multiple choice, and Section Two required students to write the hiragana reading, including hiragana with diatric marks and blended sounds. The most significant changes between the pre- and post- test occurred at the top (students receiving 100% increased from 7% - 46%) and at the lower end (students receiving under 50% dropped from 24% to 9%).

Word Recognition

Section Three asked students to circle the picture that matched the written word, and while 8% of students received a 0 score in the pre-test, no students received a 0 score in the post test. At the other end of the scale, while only 2% of students received 100% in the pre-test, this number increased to 27% in the post-test. 60% of students received a score of 30% or less in the pre-test, 71% of students received a score of 50% or more in the post test (27% earning 100% score).

Sentence Recognition

In Section Four, students were asked to read five sentences, and then choose which two pictures matched the written sentence. In the pre-test, 49% of students received a score of 0, which dropped to 8% in the post test. At the other end of the scale, while only 8% of students received 100% in the pre-test this increased to 58% in the post-test.

While there were a few students whose results did not follow the general trend, the majority of students registered some improvement in their reading ability and this was more evident in the word and sentence recognition than in the hiragana recognition section of the test.

2.2 Fluency

The second set of data that recorded was the time that students' took to complete each section. In Section One, Hiragana recognition multiple choice questions, 72% of students recorded a faster reading time between the pre- and post- tests, indicating that less time was required to read the hiragana and select the matching reading. In following the generally accepted understanding that increased speed indicates increased fluency, this result would suggest that 72% of students increased their fluency in reading hiragana characters. This percentage dropped to 42.5% in Section Two, where students had to recognise more complex hiragana characters and write the correct reading.

For Section Three, where students had to match an image to a written word, 57.5% of students recorded a faster time, and in Section Four, the percentage was 45%.

While automaticity and speed certainly do indicate an increase in fluency in many studies as was outlined in the Introduction, observation of the students during the pre- and post- tests suggested that this was not necessarily the case for students. While some students did demonstrate automaticity in their reading during the post- test, other students took more time because they were making a more concerted effort in reading than they had in the pre-test.

After witnessing this phenomenon in the post- test, I initiated a discussion with all three classes asking how they found the test and how their experience differed from the pre-test. The students' responses included:

> *'I found it really easy to read the words this time.'*
> *'I was able to read the sentences more easily.'*
> *'I just guessed in the first test, but his time I actually tried to read the words.'*
> *'The more you know, the harder it gets.'*

This would explain why, where the overall trend in scores changed significantly between the pre- and post- tests, this was not replicated in the time differences. While only a small percentage of students registered negative change between pre- and post- test in the scores – that is their overall score actually decreased between the pre- and post- test, this percentage was significantly higher in relation to difference in time suggesting that many students required more time to complete the post-test than the pre-test.

3. Summary

One of the most notable aspects of this ARP was observing that as students' reading skills improved, so did their motivation. Another unexpected surprise during this ARP occurred in the pre-test. The expectation was that all the students would easily complete Sections One and Two which related to the characters and struggle more with whole word and sentence recognition. It therefore came as quite a surprise to learn that many students found reading words was easier than individual characters. While this is certainly the case in reading English, it was an unexpected revelation in reading Japanese as an L2.

The most remarkable aspect of this ARP, however, occurred early in the project, during an activity where students were reading words on the IWB and were asked the question, 'How did you read that word?' The students revealed strategies and methods that were unique and it became clear that sharing of reading strategies using the IWB was one of the most effective learning experiences. The IWB provided a linguistic theatre and support mechanism as the students were given their own voice to share reading strategies and teach each other.

The results of this ARP show a strong trend supporting the use of IWB and Word Magnets to develop reading fluency – particularly in whole word and sentence reading. The use of the IWB not only engaged students, but also provided students with a vital visual and tactile medium that allowed them to take linguistic risks in a supportive environment.

References

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[3] Gorsuch, G., & Taguchi, E. (2010). Developing reading fluency and comprehension using repeated reading: Evidence from longitudinal student reports. *Language Teaching Research*, *14*(1), 27-59.