

Handheld-Device Enhanced Learning with Nintendo's Applications Beyond Institution and Country (HANABI Project)

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Abstract

Students on Japanese degree programmes in the UK spend a valuable year in Japan to immerse themselves in Japanese culture and improve their language skills. However, while in Japan students may suffer from social isolation and limited pedagogical support from their home institutions. The JISC-funded HANABI project used Nintendo DSi consoles to provide mobile language support for students during this year, and to link students with each other and with their tutors in the UK. A key reason for the choice of DSi is that users can handwrite directly onto its touch screen with the stylus, as handwriting practice is essential to master and maintain non-alphabetical languages such as Chinese, Arabic and Japanese. DSi's free software Flipnote Studio allows users to handwrite Japanese characters and record short spoken sentences, save them and share them with other students via Hatena's 'Flipnote Theatre' using the built-in WiFi connection. This facility for creating and sharing enabled the online tutor to set written and spoken language tasks, provide feedback to students in Japan and encourage students to collaborate on story-writing. However, in evaluating student use in the first year it was found that the use of the technology by students was hampered by difficulty in accessing WiFi, time constraints and contact with fellow students in Japan.

From the results of the language test on return and interviews with the students, we concluded that the project has contributed to the students' language learning within the context of their year abroad as a supplement to the learning achieved in formal classes at the host institutions and through cultural immersion. Finding solutions to the technical and social barriers and adapting learning materials following reflection on student feedback has provided a road-map of the way forward to make the learning experience more effective and inclusive.

1. Introduction

The HANABI (<https://www.wiki.ed.ac.uk/display/JISC/JISC+Learning+and+Teaching+Innovation>) project was a one-year project from November 2009 to October 2010 which was mainly funded by JISC, but sustained since then within the subject area.

The MA Honours in Japanese programme at the University of Edinburgh requires students to spend their third year at a university in Japan for cultural immersion, improvement of language skills, and understanding of foreign culture and society. However, in the past some students have encountered issues with social isolation, limited pedagogical support from their home institution, and disparity in the learning outcomes and achievements after the completion of the year abroad, due to differences amongst host institutions' curricula. Furthermore, assessment of the third-year programme is conducted retrospectively, which has sometimes resulted in failure to address pedagogical support problems when they arise.

To address the above issues, a mobile / handheld device is ideal, since the portability and mobility of such devices allow the students on year abroad to learn 'anytime, anyplace' [1], away from the home institution. Interest in mobile e-learning has grown rapidly, with a recent emphasis on mobile phones [2-5], but the Nintendo DSi, released in November 2008 in Japan and 2009 worldwide, was selected for this project on the grounds of its cost, popularity, size, durability and handwriting facility on a resistive touch screen with a stylus, which is more similar to the traditional pen-and-paper writing than other touch screen devices with capacitive touch screen (e.g. iPhone). Handwriting practice is fundamental for learners of non-alphabetical writing systems such as Japanese, which has three distinct types of character and requires mastery of more than 3000 for fluency. Nintendo DS series consoles have been used widely as a mobile learning device in Japan, including at educational institutions [6,7]. Some former students also used them as a dictionary or language learning tool in class. From this observation, we concluded that the use of the Nintendo DSi console as an e-learning tool might be helpful in enhancing students' educational experience during the year abroad and further integrating this learning with the overall programme.

DSi's free application Flipnote Studio (released in December 2008) was chosen for its functionalities: it allows users to draw graphical representations of Japanese characters, record spoken sentences and share them via WiFi connection. By using them, the tutors provide students with regular language exercises, and students post their responses back to their tutors, who assess them and provide feedback. Some students' work could be shared with other students using Hatena's dedicated free webspace, "Flipnote Hatena".

Although we have used other web-based and computer-based systems/programmes for the project [8], in this paper we focus on our findings of using the chosen console to link third-year students with co-students elsewhere in Japan and with tutors back home, and on assessing the use of handheld games consoles as a medium for delivering e-learning to communities of students learning non-European languages with consideration on whether it might benefit non-language programmes.

2. Methodology

The project's strategy was to work mainly with the 2009–10 cohort of third-year students (24 in total) on exchange at 13 institutions in Japan to develop both the infrastructure and learning exercises for using games consoles to support Japanese language learning. After two introductory DSi workshops in Japan in December 2009, a variety of language exercises were delivered: 1. tasks of Kanji (Chinese characters) reading/writing, vocabulary and grammar- students also created some example sentences with the given words (Fig. 1-3), 2. dictation, 3. Creative tasks (New Year's card, 1-minute speech), 4. Collaborative task (reading and group relay writing task, Fig 4-6). Since the old L2 level of the Japanese Language Proficiency Test (JLPT hereafter; the levels were revised in the summer 2010) is used as a guideline to measure language learning outcomes of the year abroad, we have given some tasks in two JLPT levels- L3 (the new N4: lower intermediate: the one level up from the end of the second year), and L2 (the new N2: upper-intermediate, by the end of the third year), all available to be downloaded via their DSi console from 'Japanese3EdinburghUni' Channel on Flipnote Hatena.

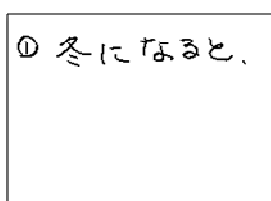


Fig. 1. Grammar task

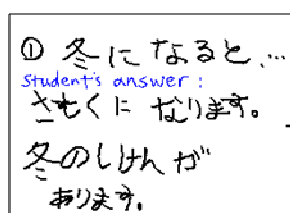


Fig. 2. Student's answer to Fig. 1

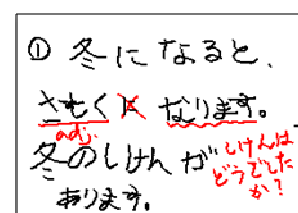
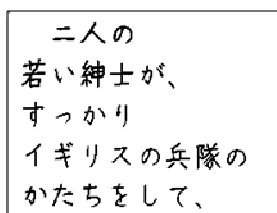
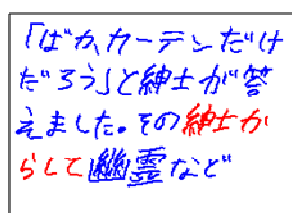


Fig. 3. Feedback to Fig. 2



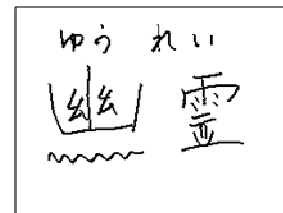
二人の
 若い紳士が、
 すっかり
 イギリスの兵隊の
 かたちをして、

Fig. 4. Reading comprehension



「はるかカーテンだけ
 たろう」と紳士が答
 えました。その紳士が
 らして幽霊など

Fig. 5. Student collaborative work



ゆう れい
 幽霊

Fig. 6. Correction from Tutor

Having all the tasks on the channel allows students to find and download the tasks from tutors and to edit and upload their work easily. Flipnote Letter function, which enables the user to send a Flipnote to someone privately, was used when students sent their answers of simple language tasks directly back to the tutors and for the tutors' feedback to the students. Tutors sent feedback on writing characters and pronunciation as well as encouragement with pictures and voice. To provide feedback to uploaded students' work, tutors used the comment facility on Flipnote Hatena.

3. Evaluation and results

Evaluation of the project is drawn from a survey of the Flipnote tasks (JLPT related tasks: 39.5% in average, collaborative task: 39.1% and presentation: 21.7%), the online survey questionnaire (April to July 2010, 65.2 % response rate), and interviews with students on their return to UK (22 students, 2 withdrawals) as well as the reports from the tutors.

3.1 Flipnote Studio tasks

In general, the introduction of language learning support was welcomed by the students, but approximately 40% of the students reported the difficulty of writing on a small touch screen with a stylus, especially for longer texts. The most popular Flipnote tasks were writing and reading kanji characters (45%), since they found these simple and easy to write on even a small screen, and the least popular ones were dictations, with only one student completing them. The task of recording a speech and uploading it to share with other students was another less popular one, since some students didn't upload it but sent it to only the tutor because they were too embarrassed to be heard by others. The collaborative task, which was a group relay writing exercise, requiring students to continue and complete a story from opening text given by the tutor, did not have a significantly high participation rate, but the results from the interviews show that the participants really enjoyed this task. It seems crucial to adjust the tasks according to their popularity and student feedback, as a higher student motivation will improve task effectiveness.

3.2 Online test and JLPT Level 2 Mock test result and online tutoring participation

We conducted a mock test of JLPT Level 2 on the students' return to the UK (October 2010) to evaluate the students' language learning progress during the year abroad.

We divided them into three groups according to their task participation rate: High (10 students, 5-11 times out of 13), Low (7 students, 1-3 times), and 0 participation (5 students). Two out of twenty-four students, one in the Low and the other in the 0 participation groups, withdrew from the project, so they are not included in this data.

As shown in Fig 7, there was only a slight difference among those groups in the result of our online test in the level of JLPT L3 conducted in May 2010, before the Level 2 tasks were released. In contrast, the result of JLPT Level 2 mock test on their return to Edinburgh shows a significant difference (maximum 19%) between the High participation groups and the others.

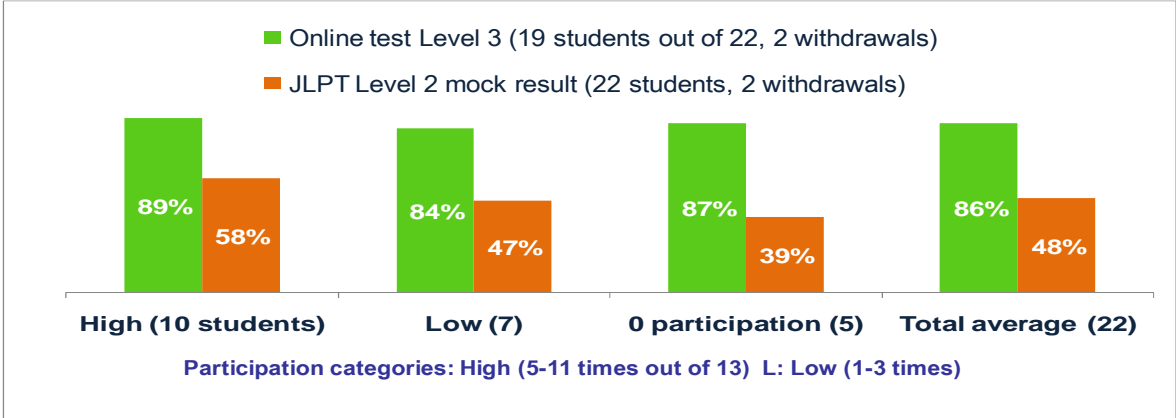


Fig.7. Online test L3 (May 10) and JLPT L2 Mock test (Oct 10) results and Flipnote tutoring participation

At a closer look at the test result in Fig.8, the High participation group achieved more than 50% in all the categories (1. Kanji / Vocabulary / Grammar, 2. Reading comprehension, and 3. Listening), but no participation group failed to achieve 50% in any category, with the biggest gap in Reading comprehension. Although the more popular tasks were focused on vocabulary and grammar rather than reading and listening comprehension, the handwriting practice to memorise the characters/vocabulary and applying their knowledge of learned vocabulary and grammar to produce sentences/texts may have contributed somewhat to the overall Japanese language learning of the High participation group.

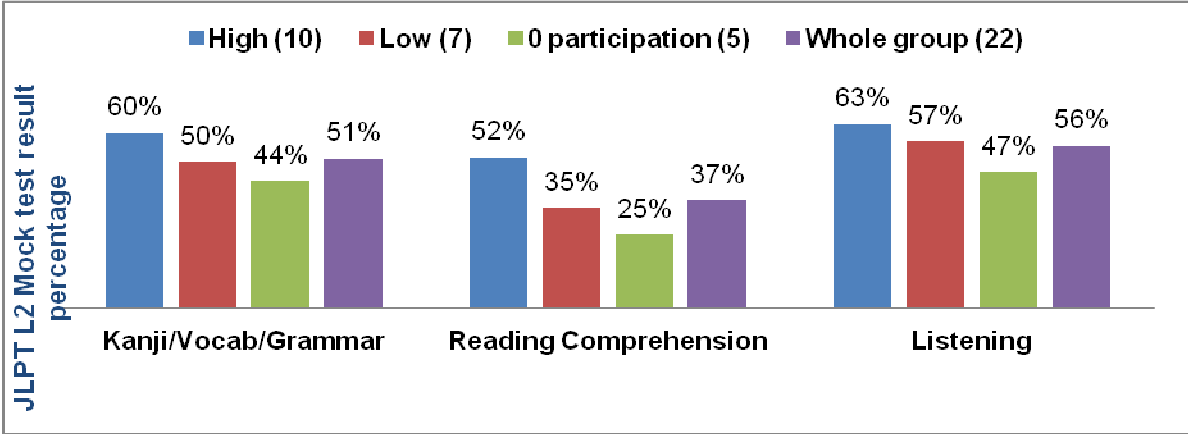


Fig.8. JLPT L2 Mock Test detailed results and Flipnote task participation

This shows that the project contributed to the students' language learning within the context of a year abroad in which they also benefited from other input such as formal classes at the host institutions and linguistic as well as cultural immersion.

4. Issues and challenges

4.1. Participation

Limited or non-participation was one of the main issues to emerge through the project. It was linked to various factors, including pressure of work and the different timetable at the host universities, limited familiarity and confidence with consoles, difficulty of access to a wireless network, and low motivation because it was not part of the formal, summative assessment.

Re-assessment of the level and kinds of pedagogical intervention is needed, taking into account the fact that third-year students on exchange placements are already formally enrolled in courses at another institution and the extent to which activities are embedded in the curriculum.

4.2. WiFi issues

Since Nintendo DSi does not support web-based log-in type WiFi registration, the use of Flipnote Studio to connect WiFi is restricted to DS-compatible hotspots such as DS Station or hotspot without any registration process. Although a list of those compatible hotspots was given to the students, they still reported difficulty in finding one near their accommodation. Some students in the high-participation group said that one of them had set up a WiFi in his own accommodation and they could share the network, and that helped a lot for completing tasks regularly. This problem could be solved if they had their own wireless network compatible with Nintendo DS series, in their accommodation or one on the campus of the host universities, or if the consoles allowed use of any type of hotspots, including enabling VPN (virtual private network) to connect to a secure wireless network as already offered at some universities.

4.3. Restrictions in the functionality of Flipnote Letter

Flipnote Letter system is great to send and receive private Flipnotes but these cannot be downloaded onto students' or tutors' own consoles. Not only does it not allow the users to download it for editing, or to flick through pages, but it only plays at a certain speed on the DSi. It has therefore been difficult to read students' answers on the DSi. This system gave the tutors extra work, especially when tasks had many pages. A possible solution to shorten the time for feedback is to have all the answers from students uploaded to Flipnote Hatena, or make tasks much shorter, but the improvement of Flipnote Letter service is vital to sustain the tutorial activity.

4.4. Region locks

During the project, we discovered that the DSi's regional lock may cause a problem in the future. The regional lock does not allow users to have access to Flipnotes made with different-region models of DSi consoles. They cannot be viewed nor downloaded onto different-region consoles. This will be a major problem if we expand this project to other subjects or international activities, as it restricts users to models with the same regional settings. Since this matter has international legal implications, it may not be solved easily.

5. Conclusion

Up to the point of the original completion time of the funded project, we have concluded that the project has enhanced learning for many students during the third year and has also enhanced their

experience of the year in Japan by providing both written and audio feedback, speedy response and exchange. However, there are several technical, organizational and pedagogical issues to be addressed: WiFi access at host universities, increase in preparation for console-based learning before the third year, and refining the tasks and assessment to raise the students' motivation.

To sustain the project and improve its effectiveness, we have changed some simple tasks to self-study Flipnote materials which students can do on a voluntary basis to complement their year abroad study rather than adding extra burden to the already demanding workload at the host university, but put more focus on collaborative work to keep the communication among the students and tutor, to keep the 'classroom' atmosphere. Another addition is introducing some commercially available software as self-study material- a kanji learning software for applying the most popular vocabulary- or kanji-learning strategy 'repeated handwriting' approach as well as a Japanese adventure game software for reading comprehension practice. This is a recent addition and we are still working on how to implement it into their honours study. This year, we have had a massive negative impact on the project since the earthquake in March 11, but we are determined to find solutions to maintain the activities.

The latest Nintendo DS series, 3DS, has some improvements in wireless network and communication, both local network (e.g. Street Pass) and WiFi. It keeps connected to the internet after the web-based WiFi registration on its browser so that 3DS WiFi-enabled software/applications can also connect, which could solve the WiFi issue of the earlier models. This gives us an insight into possible future 3DS applications or software suitable for mobile-distance education and the further assessment of handheld games consoles as a device of mobile e-learning could be feasible to sustain and improve the project activities and adapt its findings to other fields of learning.

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