

Development of Language Learning Materials using ARIS

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1. Introduction

ARIS (Augmented-Reality and Interactive Stories) is a software platform for creating and playing mobile games, tours and interactive stories. It is developed as free, open-source software at the University of Wisconsin Madison. (Project director: David Gagnon) ARIS consists of a mobile app for iOS devices (i.e. iPhone, iPod, iPad) and an editor that runs in a web browser (Godwin-Jones, R., 2014, Sykes & Reinhardt, 2013). Currently there is no app available for Android OS. The learning environment ARIS creates for mobile apps falls in the category called augmented reality. It makes use of real world information such as the locations of players and actual buildings. This is different from virtual reality where the entire world is created within the app itself. Thus, students may be directed to physically go outside the classroom. For example, an ARIS-driven scavenger hunt will be a type of application that the ARIS environment can offer. The full information on ARIS is available at <http://arisgames.org>.

While ARIS uses GPS technology to detect players' locations, it provides three additional features of interaction. One is the use of QR code. QR code becomes useful when the GPS does not detect location well, such as inside multi-floor buildings. Printed QR codes can be used as precise targets to be found for discovery games. The second is the player's note feature. With this feature, a player can upload text, audio, photo, or video notes to the game and leave them for other players to see, read, or listen to. The last one is called the "offsite mode." When the offsite mode of ARIS is turned on, a player can make virtual trips to any location that the content developer sets up.

There have been active developments of ARIS content in a number of disciplines, but the number of applications in foreign language remains small. (Holden & Sykes, 2011; Sykes & Reinhardt, 2012)

The above-mentioned features of ARIS are promising to create interesting instructional content in foreign language education, and the editor of ARIS appears to be user-friendly enough for regular content experts (such as language instructors) to develop games without a professional programmer's help. It is still necessary to test how regular language instructors handle the editor.

The objectives of the present project are (1) to develop different types of ARIS content in Japanese language learning, (2) to collect feedback from students on the content and ARIS environment, and (3) to collect feedback from content developers (i.e. language instructors) on ARIS.

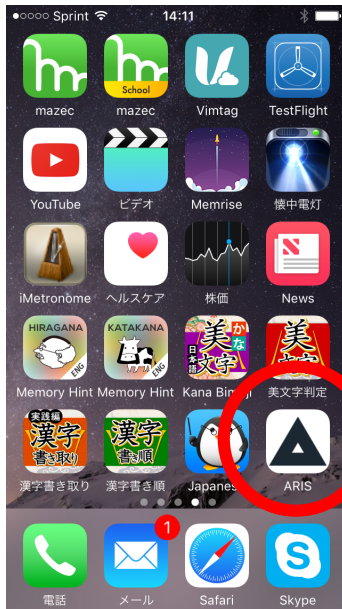
The five types of instructional content developed for the present project are (1) an orientation map of campus for newly arrived students in the School of Japanese (all levels), (2) a scavenger hunt in beginning level Japanese (Level 1), (3) an information map for places of interest in Middlebury for future students of the School of Japanese (Level 3), (4) virtual trips to learn about authors' lives to prepare students for in-class readings in advanced level Japanese (Level 5), and (5) an audio guide for a photo exhibit of Japanese traditional tattoos.

(In this report, the term "game" is used to refer to all materials we have developed.)

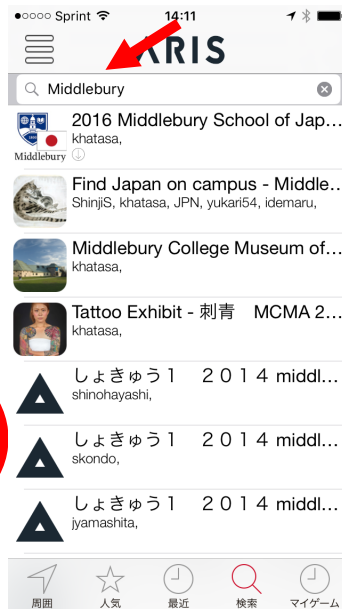
2. Materials developed under the current project

In the following section, each learning material is described with a series of screen shots. (If you have an Apple device, you can download the app from App Store.)

The first screen shot shows the icon of the ARIS app on iPhone once the app is downloaded from App Store. It is free. Initially, ARIS asks a user to create an account with a login name and a password. Once you have an account, you can search a game (content) and play it. The second screen shot shows the result of searching with “Middlebury” as a key word. The five games described below are all available for playing.



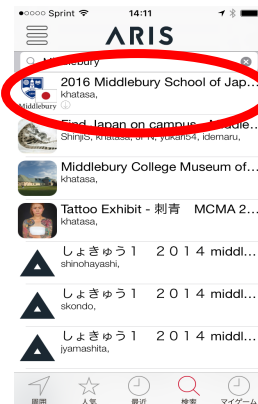
ARIS icon



search result with “Middlebury”

2.1 Orientation map of campus

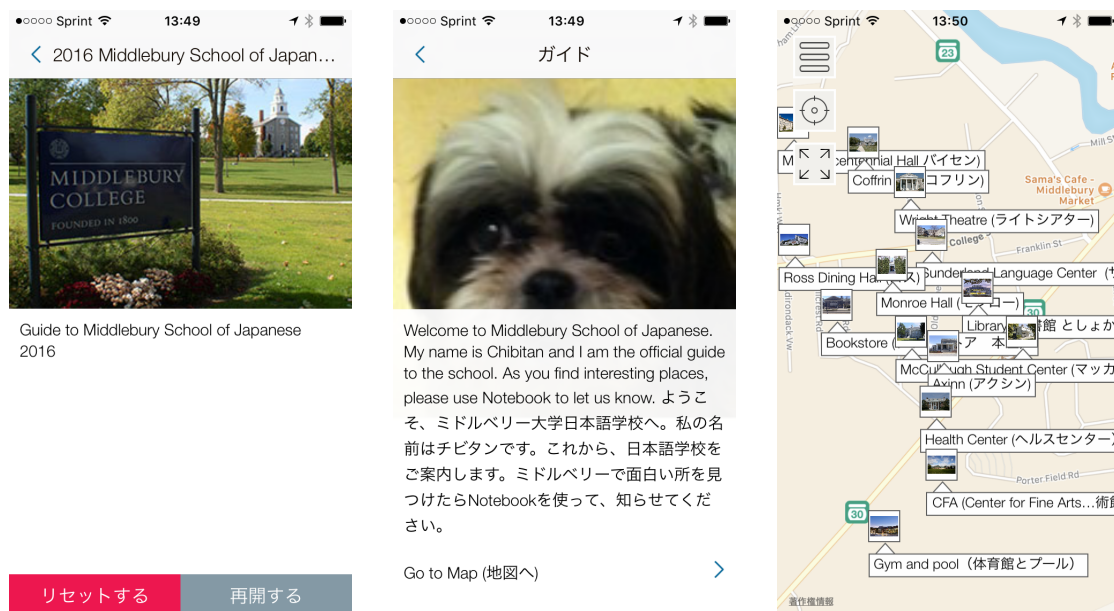
Name of game: 2016 Middlebury School of Japanese



“2016 Middlebury School of Japanese” provides an interactive orientation map of the Middlebury campus in English and in Japanese. It is intended to be used by newly arrived students of the School of Japanese in all levels.

After an introductory page, the game presents a campus map with thumbnail photos and labels of important locations. A player zooms in and touches the one he wants to know about (e.g. Coffrin Hall which is the main building for School of Japanese). When a player opens Ross Dining Hall, which is the main dining hall for School of Japanese, he sees meal schedule. Since the map indicates the current location of the player, it is easy to feel where each building is. The map also contains some useful locations outside campus such as grocery stores.

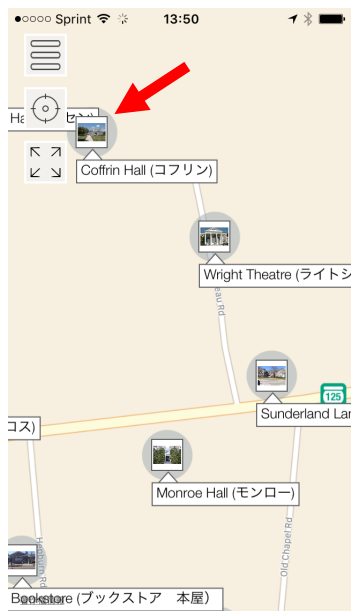
The current implementation of this game is set in the offsite mode, so students do not have to move around to get information. However, if it is implemented in onsite mode, a walking-tour can be set up. A player is instructed to go to a pre-selected location. Only once he/she arrives at the location will the necessary information be given. If the school has a set of locations that every student should know, a game can be made to require that all locations must be visited before the game ends.



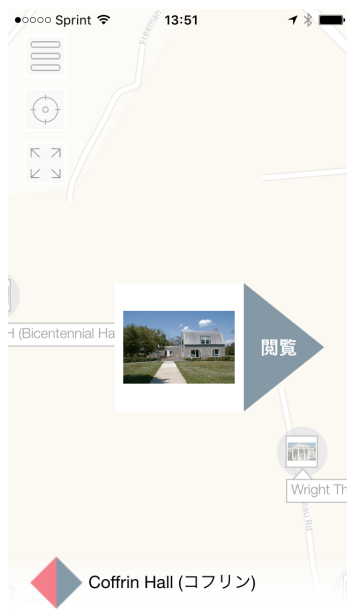
<opening page>

<explanation>

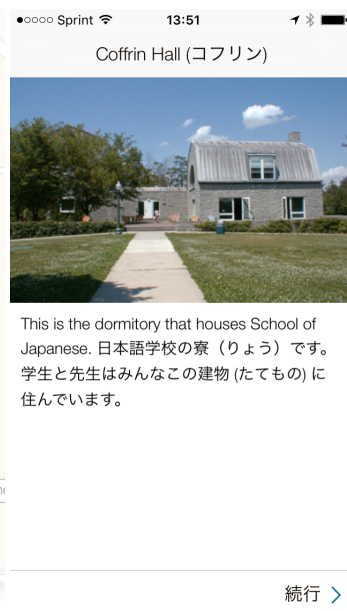
<map in ARIS>



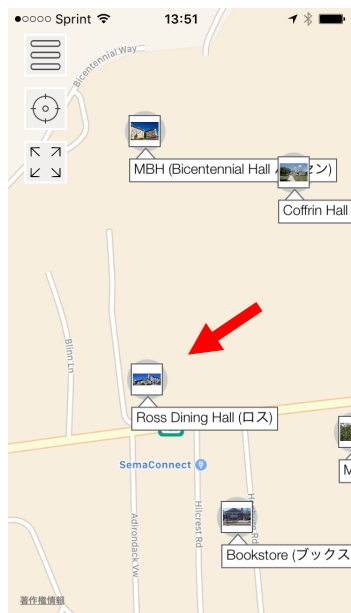
<thumbnail of Coffrin>



<Coffrin Hall>



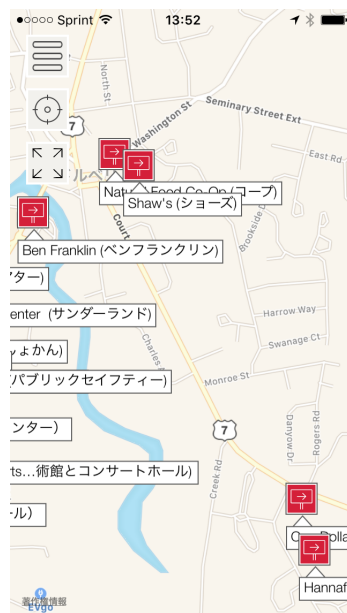
<A player sees a photo and text about the building>



<thumbnail of Ross Hall>



<A player sees the meal schedule.>



<map of town>

2.2 Scavenger hunt in beginning level Japanese

Name of game: 2016 しよきゅう1 ミドルベリー スカベンジャーハント

In this game of scavenger hunt, groups of students in level 1 Japanese receive a series of directives, tasks and questions in Japanese. They move from one location to another on campus by following directives to finish the game. The language they have learned has been incorporated in the game, and they only use Japanese among them because they are under the language pledge. This game is conducted on the last day of instruction as a fun activity. Thus, students' performances of the game was not evaluated.



1. The class meets in the lounge of a dormitory. An instructor introduces the game to the students and assigns them to groups of two or three. The instructor gives each group the following items:

- A bag of items they will need later in the hunt. (origami paper, instruction on how to make a paper crane, 2500 yen <play money>, and a telephone number)
- A clue written in Japanese with many location nouns. The sentence tells the students where a QR code is hidden.

Example: しよきゅう1 のオフィスの五つみぎのドアのまえのへやの中のまどのみぎの 上から三番目の本だなの下にあります。

The students decode the clue and find a QR code which is necessary to login to ARIS. Then, the students receive the first directive to see another instructor.





ミドルベリー日本語学校 初級1 スカベン
ジャーハント

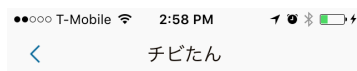
ニューゲーム



ログインしましたね。では、ゲームをはじめ
ましょう。

続行 >

<You are now logged in.
Let's start.>



はやし先生に会って下さい。

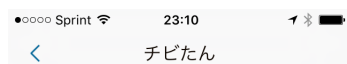
Bye bye



<Meet Hayashi-sensei.>

2. The instructor tells the students to say a tongue twister in five seconds and record their voices. Upon uploading the recording to ARIS, the game advances.

3. The students are instructed to make a paper crane using the origami paper. They take a photo of the crane and upload it to ARIS. The game advances.



かばんの中のおりがみで、つるを一つ作っ
てください。そして、しゃしんをとって、
ARISにアップロードして下さい。

Uploadする



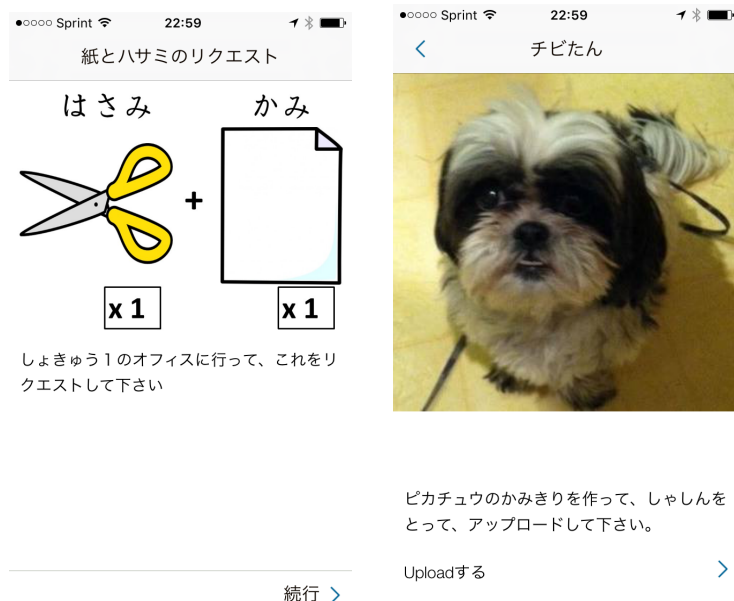
かわいいですよ

コメント

<Take a piece of origami paper
from the bag. Make a crane,
take a photo, and upload it.>

<student's photo of origami>

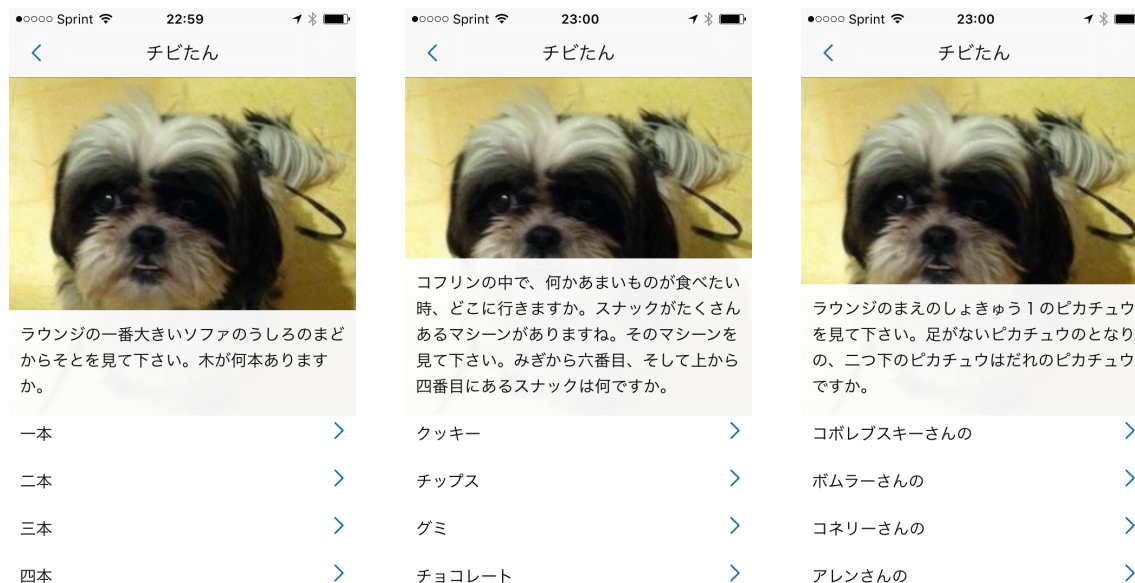
4. The game tells students to go to instructor's office and ask for a pair of scissors and a piece of paper. They cut out a Pikachu, take a picture, and upload it to ARIS. (A paper cutting artist visited the school during the session, so the students are familiar with what they are supposed to do.)



<Go to our office. Request these.>

<Cut Pikachuu, take a photo, and upload it. >

5. Four multiple-choice questions on ARIS follow next. In order to answer these questions, students must walk from their dormitory to a classroom building.



<Look out of the window behind the largest sofa in the lounge. How many trees are there? >

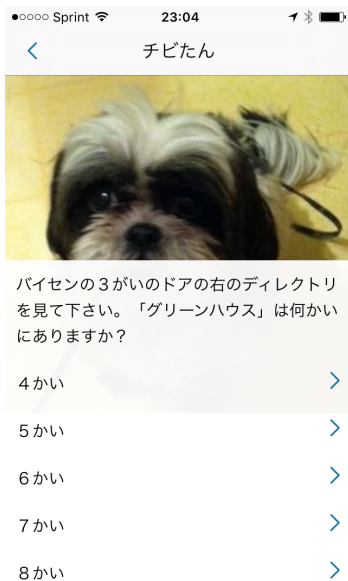
<In the vending machine in Coffrin, what is in the cell sixth from the right and fourth from the top? >

<Look at Pikachu posted in the lounge. Who made the one next to the legless Pikachu? >



<When was the large black object next to Bicentennial Hall built?>

6. In the classroom building, students answer two more multiple-choice questions. They are also asked to take a picture of a chocolate tree in the greenhouse and upload it to ARIS.



<Which floor is the greenhouse on? >

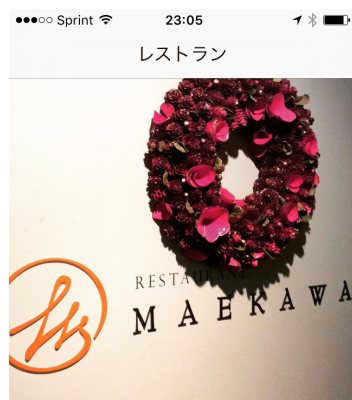


<Which is the largest room, 417, 423, or 430? >



<Go to the greenhouse and take a photo of a cacao tree. >

7. The students are told to go to a mock restaurant created in a classroom. In the restaurant, an instructor waits for the students' arrival, and when they enter the room, she plays the role of waitress. The students order food and drinks as customers. They also pay for them afterwards with the play money in the bag they received at the beginning of the hunt.



バイセン219のレストラン「まえかわ」に行
って、ウェートレス(きれいな女の人)に好き
な食べものと飲みものをちゅうもんして下さ
い。

続行 >

<Order your favorite food and
drink in room 219. >

8. The students leave the classroom building and they are instructed to go to three other buildings. They must answer a multiple-choice question at each location.



ロスに行って、たてものの中に入って、しょく
どうの中のしゃしんを見て下さい(through
the glass walls)。ひだりから二番目の下のし
ゃしんに 木が何本ありますか。

- 六本 >
- 七本 >
- 八本 >

<Go to Ross. How many
trees do you see in the
photo second from the left
on the bottom? >



アディロンダックハウスの まえの バスで
い(bus stop)に行ってください。びょういんに
行く あおいラインのバスは、土曜日にいく
つありますか？

- むっつ >
- ななつ >
- やっつ >

<Go to the bus stop in front
Adirondack House. How
many blue line buses go
to a hospital on Saturday? >

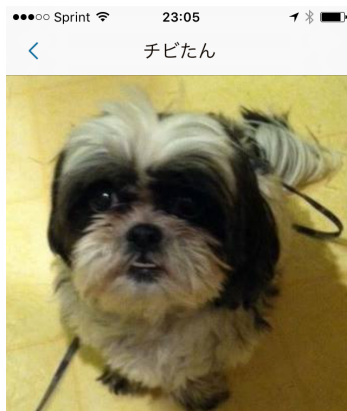


ブロクターの本やに行ってください。本やは
月曜日から金曜日までの 何時から何時ま
で あいて(open)いますか？

- 八時半から四時まで >
- 八時半から五時まで >
- 九時半から五時まで >

<Go to the bookstore. What
are their business hours from
Monday through Friday? >

9. After answering the questions, the students are asked to make a phone call to the head instructor for the next clue. The phone number they are given, however, is another instructor's number. Students ask for the correct one. The head instructor tells the students to go to the student union building.



はやし先生にでんわ (929-384-4033) をかけて、つぎのタスクを聞いて下さい

Bye bye



<Call Hayashi-sensei and get the next task. >

10. In the student union building, students answer four multiple-choice questions.



日曜日のごぜん十二時半



金曜日のごご十一時



土曜日のごご五時半



日曜日のごご十一時



むつつ



ふたつ



いつつ



よつつ



2809番



2437番



2851番



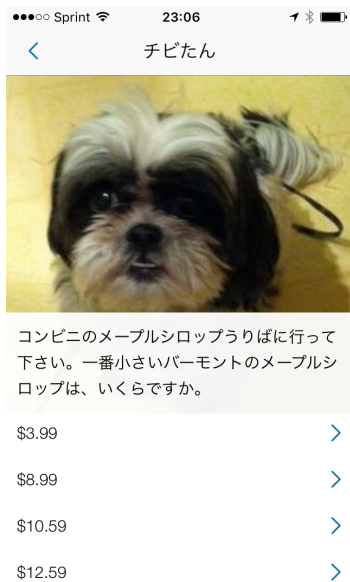
2751番



<Go to Crossroad Café.
When are they closed? >

<Go to the convenience
store. How many flavors of
trail mix do they carry? >

<Go to the post office. What is
the mailbox number fourth
from 2800? >



<Go to the convenience store.
How much is the smallest
Vermont maple syrup? >

11. After these questions, the students are told to go to the library.



<Go to the library. Meet Hayashi-sensei in the café. >

12. When they arrive to the library, the students are asked to look for the Japanese section and take a picture of anything written Japanese and upload it to ARIS.



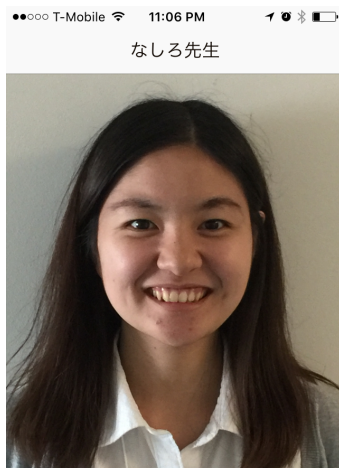
としょかんの中で日本語を見つけて、しゃし
んを1まいとって、アップロードして下さ
い。

しゃしんをとる



<Find Japanese text in the library.
Take a photo and upload it.>

13. The students are asked to go to the café in the library and find an instructor. The instructor gives the students a crossword puzzle. The students solve the puzzles in the café.



しゃしんをとって、1かいのカフェに きて
ください。

Continue



<Come to the café on the first floor.>

14. After completing the task, the instructor tells the students to go to a café downtown. Other instructors are already waiting for the students there. At the café, the instructors give the final task, which is to say all of the classmates' full names. This is the end of the scavenger hunt activity.

2.3 Information map on places of interest in Middlebury for future intermediate level Japanese students (Level 3)

Name of game: 中級1ミドルベリー日本語学校のオススメのスポット！



The students in Level 3 produced contents for ARIS in Japanese. Based on the contents that students supplied, one of the instructors implemented them in an ARIS game. The following steps describe what students and instructors did for this project.

1. Instructors had students discuss two topics: the most enjoyable thing in the program and places you would like to introduce to students next year. Students worked in pairs and made short reports. They were instructed to try, (1) to choose a location that is relatively unknown, (2) to write content in such way that students next year will be interested in, and (3) to use as much grammar that they have learned as possible.
2. Instructors demonstrated a sample ARIS game in which instructors show their offices using audio recording and photos.
3. Students drafted scripts describing their selected locations and turned them in to teachers for feedback.
4. When the instructors returned corrected scripts, students made audio recordings by reading them. They were instructed that every member must participate in the recording. They also turned in a photo of the location.
5. An instructor compiled the audio recordings and photos and placed them in an ARIS game “中級1ミドルベリー日本語学校のオススメのスポット！.”



2016年の中級1の学生がミドルベリーのオススメの場所を紹介します。



ミドルベリー日本語学校には、みなさんに紹介したいオススメのスポットがたくさんあるんです！見てみませんか。

えっと、また今度見ます。



はい、見てみたいです。



では、マップの上にあるアイコンをクリックして、オススメの場所を見てみてください！

行ってきます！



ニューゲーム

<We will sow interesting spots in Middlebury.>

<Are you interested in looking at some spots?>

<Touch an icon on the map.>



<Indicating a room for studying and Stone Leaf>

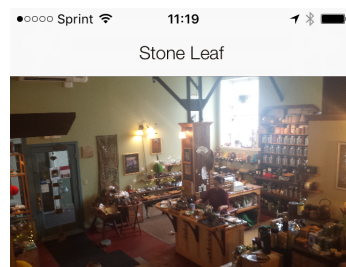


<Room for studying Japanese>



<A player hears an audio annotation.>

続行 >



続行 >

<A player touches the icon.> <A player hears an audio annotation.>

2.4 Virtual trips to trace an author's life to prepare students for in-class readings in advanced level Japanese (Level 5)

Name of game: 30 の物語- <name of a featured person>



Instructors developed nine ARIS contents for reading materials that they adopted in the course. (Ishikawa, Satoru “The Great Japanese 30 の物語 中上級-人物で学ぶ日本語” くろしお出版)

This is a list of ARIS games developed for the project:

1. 夏目漱石 (Soseki Natsume, novelist 1867-1916)
2. 草間彌生 (Yayoi Kusama, avant-garde artist)
3. 杉浦千畝 (Chiune Sugiura, diplomat in Lithuania during WWII)
4. 藤田哲也 (Tetsuya Fujita, severe storms researcher 1920-1998)
5. 野口健 (Ken Noguchi, alpinist 1973-)
6. 五嶋みどり (Midori Goto, violinist 1971-)
7. 白石義明 (Yoshiaki Shiraishi, inventor of conveyor belt sushi 1914-2001)
8. 黒澤明 (Akira Kurosawa, filmmaker 1910-1998)
9. イチロー (Ichiro Suzuki, baseball player 1973-)

The following are a series of screenshots from one of the game, Chiune Sugiura (杉浦千畝).



<Chiune Sugiura is selected.>



杉原千畝は日本の外交官として活躍した人物です。今日はARISを使って杉原のことについて勉強してみましょう。

続行 >

<We will learn about a diplomat.>



杉原千畝は、1900年に岐阜（ぎふ）県の実濃（みの）市で生まれました。それでは、地図を使って岐阜県実濃市へ行ってみましょう。

続行 >

<Chiune Sugiura was born in 1900.>



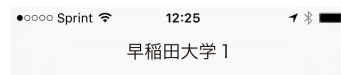
<birth place of Sugiura in Japan>



杉原は子供の頃から優秀な成績でした。杉原の父親は、杉原に医者になってほしいと思っていたようですが、杉原は医者になるのが嫌で、京城医学専門学校の入学試験では、試験に何も答えを書かずに出したそうです。

続行 >

<description of his childhood>



杉原は英語教師になろうとして早稲田大学に入学しました。地図を使って東京の早稲田大学に移動しましょう。

続行 >

<He goes to Waseda University.>



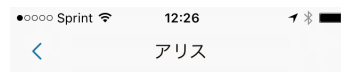
<Waseda University>



杉原は早稲田大学で英語の教師になるために勉強をしますが、英語教師になるのに反対だった父親は学費の援助をしませんでした。そのため、学費と生活費を払わなければならなくなり、苦しい状況となりました。

続行 >

<description of his life at Waseda>

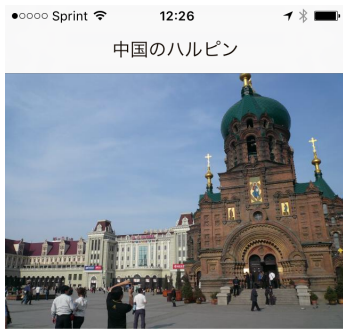


学費と生活費に困った杉原はどんなことをしたと思いますか。

外務省の留学生の募集に応募した。 >

大学を辞めて政治家の秘書になった。 >

<What did Sugiura do when he needed money for tuition?>



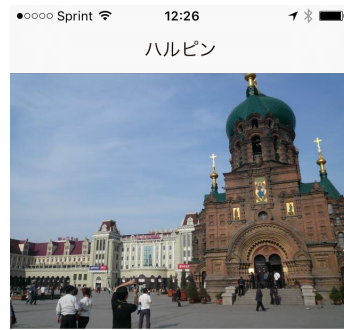
外務省の留学生募集に応募し、見事採用された杉原は中国のハルビンに行くことになりました。それでは、地図を使って中国のハルビンに行ってみましょう。

続行 >

<He Goes to Harbin, China for study abroad.>



<moving to Harbin, China>



中国のハルビンで、杉原はロシア語を勉強して、ロシア問題のエキスパートとなり、外交官として働き始めます。

続行 >

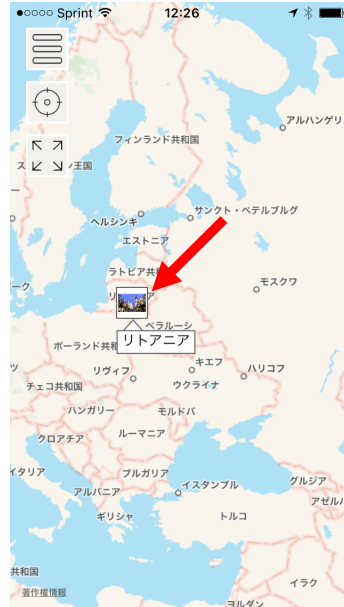
<He studies Russian in Harbin.>



杉原はリトアニアのカウナスの領事代理としてリトアニアに赴任します。地図を使ってリトアニアに移動してみましょう。

続行 >

<He is assigned to Lithuania as a diplomat.>



< moving to Lithuania>



杉原がリトアニアで領事代理を務めている間に、ドイツ軍がポーランドに攻めてきたため、多くのユダヤ人がリトアニアに逃げ込みました。

続行 >

<Lithuania receives Jewish refugees from Poland.>

イスラエル

多くのユダヤ人を助けた杉原の功績をたたえて、イスラエルのエルサレムの丘に杉原の顕彰碑が建てられています。地図を使ってイスラエルに行ってみましょう。

続行 >

<A plaque was constructed in honor of Suguire in Israel.>



顕彰碑



1985年にこの顕彰碑が建てられましたが、病気の杉原は除幕式（じょまくしき）に参加できませんでした。翌年1986年に杉原は86歳で亡くなります。それでは、『The Great Japanese 30の物語』の杉原千畝を読んでみましょう。

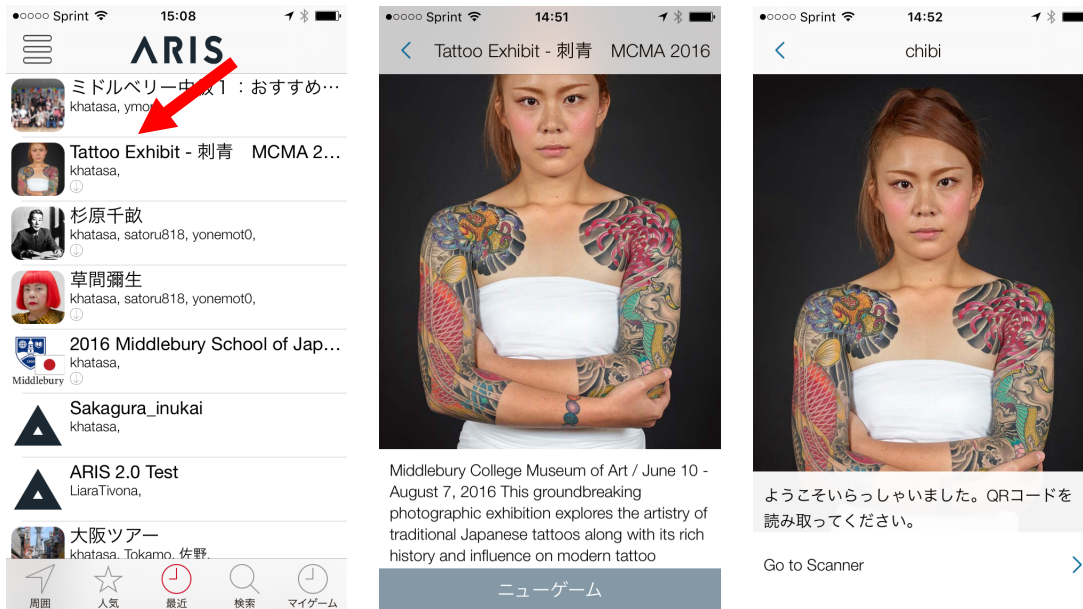
続行 >

<The plaque was made in 1985.>

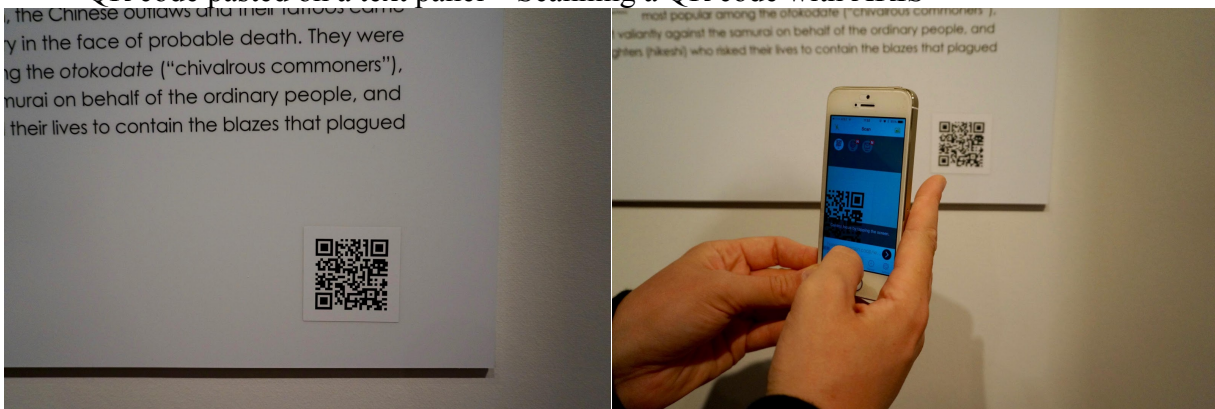
2.5 Audio guide for a photo exhibit of Japanese traditional tattoos

Name of game: Tattoo Exhibit - 刺青 MCMA 2016

This is an application that uses the QR code scanner built in ARIS to deliver text, audio, and video. Middlebury College Museum of Art had a photo exhibit of Japanese traditional tattoos taken by Kipp Fullbeck. The museum provided ten descriptive text panels for the exhibit. The text was translated into Japanese by bilingual assistants of Middlebury School of Japanese. An audio recording of the Japanese text was made and incorporated in an ARIS game entitled “Tattoo Exhibit - 刺青 MCMA 2016.” When a museum guest opens the ARIS app and starts the game, he/she can hear audio annotations in Japanese by scanning the QR code next to each text panel.



QR code pasted on a text panel Scanning a QR code with ARIS



Students listening to audio annotations in Japanese



Sample QR codes:



3. Evaluations

3.1 Scavenger Hunt (Level 1)

The following is a summary of a questionnaire conducted after the game. (See Appendix 1 for the entire questionnaire.) Since the activity was conducted at the end of the session, only five students out of fifteen answered the questionnaire. Due to the small number of respondents, the results should be considered tentative, but they reflect the general attitude of the students who participated in the activity.

- Numerical scores indicate that students liked the scavenger hunt activity; however, it must be pointed out that their performance in the game was not a part of the course grade. They thought the activity was “fun.”
- Among the sixteen tasks, students most liked the full name task and the restaurant simulation. The full name task reflects the language school environment nicely because students had been calling each other by only their last names, not knowing their first names in Japanese. The fact that they found the full name task challenging is proof that they stayed in Japanese faithfully
- Technical problems reported in the survey were primarily caused by limited programming. This scavenger hunt programming is the most extensive compared to the other games we developed.
- Students found the restaurant simulation task to be helpful/useful in reviewing language, and they found it enjoyable. This suggests that simulation and RPG are a good option for ARIS.
- It was rewarding for us (instructors) when students understood and appreciated the effort teachers put in to set up the entire activity. (This was very Middlebury.)

The instructional team for Level 1 had an instructor who is technically savvy and has extensive knowledge of the ARIS editor. He took care of all programming aspects of this game. He reported that he spent about twenty hours to put the game together. Other instructors contributed to the content of the game.

3.2 Places of interest on campus and in town (Level 3)

In this level, students did not do anything with ARIS. They only did a group writing activity. (See Appendix 2 for the entire survey.)

- Students did not indicate that this activity was more motivating or interesting than regular assignments, but they did not think it was less motivating either. Timing seems to have been problematic. Students found this activity not to be any different from other activities. (Q1 & Q2)
- Students indicated that the activity was a good review of grammatical expressions they have learned. (There were both negative and positive comments about forcing students to use new grammar) (Q3)
- Students indicated positive reactions to the availability of this game created by former students. It will be interesting to make the map available next summer from the beginning of the session. (Q4)
- Students found playing the game in ARIS to be neither easy nor difficult, but general reactions to ARIS were mixed. (Q5 & Q8)
- Reactions to the group-writing activity were mixed. (Q6 & Q7)

The fundamental ideas of the materials were good, but the execution needs more consideration. It is worth trying another time.

An instructor with some knowledge of ARIS put all of the student-produced materials in the game. It did not require extensive skills in using the ARIS editor. He reported that it took about five hours to implement this game.

3.3 Preparation for reading materials (Level 5)

Sine ARIS games were made for nine episodes from the textbook, students in this level experienced sustained use of ARIS. The class only had five students. (See Appendix 3 for the entire survey.)

- Four students had no previous knowledge of ARIS. (Q1)
- Students did not find ARIS technically difficult. (Q2.1, Q2.2, Q2.3, Q2.4)
- Students found using ARIS in Japanese class interesting, but their judgement of its usefulness was not very strong. (Q3.1, Q3.2, Q3.3, Q3.6)
- Students think ARIS should be used in class. (Q3.4)
- Students thought they learned names and locations of places in Japan and gained knowledge about famous people. (Q3.5)
- Students' reactions to using technologies in Japanese language class varied. (Q3.8)
- Students mentioned the following problems: (1) the lack of Android app, (2) the needs to improve the interface, and (3) elimination of system bugs.

Two Japanese instructors created the entire materials without any significant help from a programmer. They reported that they spent an average of three hours to finish one ARIS game.

3.4 Orientation map of campus and Audio guide for a photo exhibit (all levels)

We were not able to collect any feedback on the use of these two games.

It took about ten hours to implement the orientation map in ARIS. The map does not require high level skills with the ARIS editor.

The audio guide took ten hours to implement excluding the time needed for translation and recording. It does not require a high level of technical knowledge of the ARIS editor.

4. Conclusion

Through the current project, we demonstrated that regular language instructors can develop simple ARIS games without extensive knowledge of the ARIS editor. Although students' reactions varied, I believe it is worth continuing to develop materials to improve their quality. ARIS offers many other possibilities to explore. For next summer, I would like to incorporate the project in Level 3 into the orientation map so that students will have more opportunities to use ARIS when they arrive on campus. For another example, it would be interesting to develop orientation maps for Middlebury C.V. Starr Schools Abroad. Such orientation maps will not only be useful when students arrive at a new location abroad, but will also be valuable during pre-departure orientation and training.

The capabilities of ARIS are undeniably attractive in language learning and the ARIS editor has proven to be easy enough for regular instructors to use to develop games. However, unless an app for Android becomes available, ARIS will not be able to expand its user base. The good news is that an Android version of the app is under development to be released in 2017.

Lastly, I thank the Fund For Innovation for the support that I received. Without it, I could not have asked my instructors to develop these games during the summer.

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Appendix 1: Questionnaire of Level 1 Scavenger Hunt

Students' responses are in red.

For Q1.1 – Q1.5

Origami	Greenhouse Task
Tongue Twisters	Telephone Task
Bilingual Secretary Request	Student Center Search
Kamikiri (paper cutting)	Crossword puzzle
Task Card Search in Coffrin	Picture-of-Japanese Task
Campus Quiz (Bus times, etc.)	Full Name Task
Restaurant Simulation	iPhone ARIS Task
Web Weather Lookup Task	Other

Q1.1 Out of the tasks in the box, which task(s) did you find the most enjoyable? Why?

- 1.1.1 Bilingual Secretary Request. because it was fun to watch アレンさん struggle.
- 1.1.2 I enjoyed the restaurant simulation and the full name task. The restaurant simulation was simply too adorable – the faux money and special restaurant music in the classroom was entertaining. The full name task was useful. I felt like the 先生 were thinking about the new English world we were returning and doing what they could to ease that transition.
- 1.1.3 iPhone ARIS Task. It took us around campus, and we got to see new places like the greenhouse and the level 5 students' classroom!
- 1.1.4 Full name task. This was a fun task because it was ...trying to remember everyone's name.
- 1.1.5 Full name task because it's fun getting to know my classmates better.

Q1.2 Which task(s) did you find the least enjoyable? Why?

- 1.2.1 Restaurant simulation. We needed more お金
- 1.2.2 Perhaps the opening and closing research game. The game would have been a bit more fun helpful at the beginning of the program.
- 1.2.3 Student Center search you had to go in and out of the convenience store that are the were a little heavy.
- 1.2.4 Picture of Japanese task. Because all we had to do was go to the sign and take a picture.
- 1.2.5 Task card search in Coffrin

Q1.3 Which task(s) did you find the easiest? Why?

- 1.3.1 おりがみししょうです。
- 1.3.2 The greenhouse task. It was just a photo.
- 1.3.3 Tongue Twister, because it had a lot of fun in it.
- 1.3.4 Tongue Twister. This was fun, quick... a bit of practice I could easily say the tongue twister.
- 1.3.5 Telephone task, not much to the task

Q1.4 Which task(s) did you find the most difficult? Why?

- 1.4.1 Full name task.
- 1.4.2 Perhaps the restaurant simulation? I enjoyed that the dialogue was a little freer form compared to our classroom exercises.
- 1.4.3 Figuring out who wears glasses and who doesn't was perhaps the most challenging Funny!
- 1.4.4 Crossword. The crossword puzzle itself was fun, but the last part where we need to unscramble the word was hard.
- 1.4.5 Crossword, a lot of information

Q1.5 Which task(s) did you find the most helpful in reviewing what you have learned? Why?

- 1.5.1 Restaurant simulation.
- 1.5.2 Crossword because we had to write in katakana and full name task because we only referred to each other by last name.
- 1.5.3 Restaurant simulation because we had to use various sentence forms.
- 1.5.4 Restaurant situation. A good review practice process on ordering food..discussing between each other what we are going to eat.
- 1.5.5 Crossword, a lot of information from the whole time here

Q2. What did you think of this scavenger hunt activity? Rate from 1 (not good at all) to 5 (excellent) and explain your rating.

- 2.1 5 It was fun.
- 2.2 5 Excellent. However, I and the majority of my classmates were pretty exhausted. I would have also appreciated time given at the ice cream place for ice cream eating.
- 2.3 5
- 2.4 4 It was a bit tedious and long, but extremely fun.
- 2.5 4 I really enjoyed the activity for the most part, but I think it was a little long. Good mix of activities.

Q3 What did you think using iPhone ARIS application? Rate from 1 (not good at all) to 5 (excellent) and explain your rating.

- 3.1 3 Did not work consistently.
- 3.2 4 a bit buggy, but good overall!
- 3.3 5 Very interactive!
- 3.4 3 It was a fun app, but still has a few bugs. When we sometimes answered a question and it was correct answer, the app said it was wrong and it took three times to finally say it was correct.
- 3.5 4 Some technical difficulties but easily fixed.

Q4. Are there ways in which you think it could be improved?

- 4.1 No
- 4.2 Fix those bugs! Perhaps more features?

- 4.3 Maybe we could have icecream at the end. We couldn't because most people hadn't brought their wallets. It would have been a sweet ending experience and lovely way to end.
- 4.4 Fix the ARIS app and more fun activities.

Q5. Any additional comments?

- 5.1 No
- 5.2 Thank you for this creative last class. It was thoroughly enjoyable. Thank you for everything!
- 5.3 Thank you so much, teachers. You have worked hard!
- 5.4 This was a fun way to spend the last day of class.

Appendix 2: Level 3 Places of Interest on campus and in town

Students' responses are in red.

Q1: Compared with normal writing homework assignments, this ARIS activity was more interesting.

Strongly disagree					Strongly agree	
1	2	3	4	5		
1	0	8	3	3		(Average: 3.47 N=15)

Q2: Compared with normal classroom activities, you had higher motivation for this ARIS activity.

Strongly disagree					Strongly agree	
1	2	3	4	5		
1	2	10	2	0		(Average: 2.87 N=15)

- It was more work and a lot less convenient than doing regular homework.
- There was less pressure and it felt like something that had a purpose.
- The timing was hard because everyone was more focused on the upcoming final exam, but I do think it was an interesting assignment.
- I didn't think too much about it because of the upcoming presentation and exam
- I was really busy with studying for finals when I had this assignment, so I didn't exactly want to do it.
- It is a new activity, but not that interesting.
- It was interesting but pair work is difficult to arrange
- I would not say that my motivation had increased. Rather, it was the last assignment, so knowing that there were no other assignments afterwards made the assignment enjoyable.
- It was interesting but I enjoy working with teachers and students in a classroom setting.
- I actually really like workbook assignments so the usual homework is pretty fun for me as well.
- It just looks like a commercial for me
- It was fun, but not drastically more so than normal homework.
- Group work is the absolute worst, does not matter the task at hand.
- same as a normal assignment

Q3: This ARIS activity helped you review grammatical expressions you had learned.

Strongly disagree					Strongly agree	
1	2	3	4	5		
0	0	4	4	7		(Average: 4.2 N=15)

- It made me use a lot of grammar, and I did my best to work in as much as I could.
- The assignment made an effort to help use grammar structures in writing.
- We needed to use a significant amount of grammar in a small assignment but because it was an assignment with a partner we were able to review together with a purpose.
- Yes, the requirements for ARIS allowed the group members to use grammar we had learned

- I wasn't really thinking about that
- Certainly reviewed them.
- It was a fun challenge to try to use a lot more expressions than normally. Working with a partner made it better.
- Yes, however only to a certain extent because we tend to choose our most comfortable grammatical expressions.
- The teachers corrected our scripts
- We tried using as many grammar points as we could in this activity and having a partner to discuss how to use them is great review と思います.
- Actually it is not the ARIS but the paper sheet which is used to write helps
- It was the same as other homework.
- It felt awkward forcing to use specific grammar to describe a place. Maybe it did make a difference in explaining, but overall the grammar seemed unnecessary in this assignment.
- yes

Q4: If there was a map made by previous students, you would have wanted to use ARIS to explore Middlebury.

Strongly disagree					Strongly agree
1	2	3	4	5	
1	2	2	2	8	(Average: 3.93 N=15)

- I don't really care about exploring the campus in the first place.
- Most definitely. I didn't know about some of the places myself and I've been at Middlebury for 8 weeks.
- It'd be interesting to see how/if the interesting places changed from year to year.
- Yes, I would have wanted to see what others had recommended
- seems fun
- If I didn't know about the campus, it would be helpful.
- I am lazy.
- Exploring by oneself is nice, but extra information is really nice too.
- I personally would listen to ARIS, but I cannot say that this would be the source for interested in going to these places.
- I would like to explore the recommendations made by former students
- I didn't know about the Japanese students only section at the library or Stone Leaf Cafe until today, and I would've liked to go.
- I hate commercials and always regard commercials as junk
- I used it as much as possible before coming and wish that there had been more content.
- (Personal quirk) Work not have bothered listening to the audio.
- yes! it would have been very useful in the first couple weeks

Q5: How would you rate the level of difficulty for this ARIS activity?

Strongly disagree					Strongly agree
1	2	3	4	5	
3	3	9	0	0	(Average: 2.4 N=15)

- There was nothing complicated about this project.

- Not overly difficult, not very time consuming.
- I find writing to be one of the more difficult skills required.
- Normal difficulty
- no comment
- Working with a partner was a little difficult, especially since our schedules were so messed up because of finals.
- It was very reasonable.
- There were multiple parts, and organizing partners was a bit difficult sometimes.
- It is your own personal opinion, so it is not difficult to come up with things to say.
- It was very easy to complete compared to other class activities and homework assignments
- It was quick but having to coordinate times to meet with a partner was a little frustrating at times.
- All grammars and group works are still within in-class learnings, so the difficulty is fair
- Normal homework level.
- It was a simple assignment, just not fun or motivating.
- again, same as a normal assignment

Q6: Any advantages for the group-writing activity? (Ex: Generate more ideas?)

- It made me use a lot of grammar, which was good practice.
- Group writing was no doubt more fun than individual work. Also, helped when trying to use new grammar structures because we were able to correct each other.
- Small groups are nice because it lets you bounce ideas off each other without the stress of larger groups. You can review grammar together but there's less pressure than working with a sensei.
- Yes, we could brainstorm for with other people. It made the activity more fun.
- With two people, if one doesn't know a grammar rule, the other one could know it. Therefore, the group helps each other in reviewing grammar if something was forgotten.
- Doing the assignment pairs is better because the work gets done faster, and you're forced to communicate with people in Japanese outside of class and regular dining functions.
- Generate more ideas.
- Working with a partner made the work go by quickly which was nice, we could bounce ideas off of one another, instead of being stuck in our own individual minds.
- Yes, many advantages considering that it was more of a review. While working on the assignment, my partner was also able to correct me.
- You can learn from other students and everyone's strengths are put forth.
- Again, discussing grammar points with a partner was helpful in the sense that we are both learning but can help each other out. Also, it is always fun to try to use as many grammar points as possible, but even funnier when working with a partner to do the same.
- Group-writing helps to correct lots of mistakes when someone barely notices during a solo work.
- We had other group activities that were largely the same.
- I don't think, especially given that this assignment required for both members to be 1. on the same page, 2. generally agree about what was going to be one, and 3. care. Ultimately, one ends up doing most of the work, and if the other member does actually need help writing, this would not help them.
- Not really

Q7: Any difficulty with the group-writing activity? (Ex: Take more time?)

- I didn't really know any good places on campus, which made picking a place difficult. Also, coordinating schedules with other students during such a busy time (the end of the program) was kind of inconvenient.
- No
- Working with larger groups results in people having less of an input but the size groups that we had were really nice.
- Yes, finding the time to meet was difficult, especially considering that the last week was so busy.
- Disagreements between ideas lead to one person to scrap almost to all of the other person's sentences.
- The placement of the assignment (during final prep) was really stressful. Writing the assignment was also difficult because everyone has different ideas of what's most important.
- Took more time
- No difficulty.
- None
- People's ideas often clash with one another and the group cannot move forward.
- It didn't take a lot of time, but finding a quiet space where the both of us can record gives no flexibility. For example, I wanted to stay at CFA for longer but it was a bit far for my partner to walk to so we decided to meet halfway at the library instead, and that did take up more time. Also, thinking about having to communicate with another person just adds stress to an already stressful week.
- Conflict of schedule is always a thing for group works and it requires advanced arrangement
- The same as other homework.
- It is group work so by that alone, it is flawed and unhelpful.
- I think they create tension between people because everyone has different ideas about how they want to phrase things etc., which is very unpleasant to me

Q8: What do you think about ARIS?

- I don't really see the point of it, and I wouldn't choose to use it myself.
- Interesting little project. It will be good for next year's students.
- I think it's a really interesting idea and I would use it if it were at my home university.
- I think it's an interesting concept and good for those new to Middlebury
- It was fun.
- Nice :)
- Could be useful
- I haven't gotten a chance to use the app at all but from what I can see it's well put together.
- I think it is a great last assignment to intake the things we have learned over the course of the program. Although, we did not use every newly acquired grammatical phrases, it was still a wonderful review of content.
- If google maps had a similar function, I would use it. I wouldn't want to download another app onto my phone.

- It's a pretty cool concept but since there was pretty much nothing on there that wasn't on the Midd website or Google Maps before this week, it was mediocre. However, if classes before us had done this assignment, I would've liked to see their recommended locations.
- Nothing special but looks like a navigation with introductions
- I think it is a great tool for incoming and prospective students. For current students it is neither better nor worse than regular homework.
- It seems useful, maybe even fun perhaps, but I haven't had the experience of exploring it on my own so I can't say that it is of any value to me. However, from a geographical perspective, getting a quick rundown of where useful/important places are nearby does seem super helpful.
- It looks useful, but since it's not available for Android...

Q9: For future improvement, do you have any comments/suggestions? (Ex: any other usage of ARIS?)

- Nothing in particular.
- No
- A categorization system that allows you to filter locations by what you're looking for. For example, places to relax versus places to study.
- None at the moment
- Not really.
- I would definitely recommend doing this in conjunction with (or even in place of) the 1 minute senryu assignment we had. It's good presentation prep, but having it during finals was extremely stressful and cut into study time significantly.
- This homework was fine, but was a bit of an obstacle as it was assigned when everyone was busy with 期末 project and 試験。
- I personally think that this is a wonderful last assignment, but I think that as a map of Middlebury, people will not be counting on ARIS because there are other forms of map.
- Incorporate the Middlebury campus map
- I think showing this assignment to the next group of Japanese School students is a good idea because they might like suggestions on where to go early on so they can have more of an idea what this campus has to offer according to fellow students.
- I think if we had extracurricular activities or Aris based homework (not creating content, but using it to do games, learn about new places, etc. perhaps a scavenger hunt etc.) would be fun.
- Make it independent work. This assignment is easy and even if it wasn't, there is no need to turn it into group work. It would actually be more helpful for individuals still struggling with the subject matter if they had to do it on their own.
- Don't have any ideas

Appendix 3: Level 5 Preparation for reading materials

Students' responses are in red.

Q1. ARIS について (question about ARIS)

Q1.1 ミドルベリーに来る前に、ARIS というプログラムについて知っていましたか。
(Did you know about ARIS before you came to Middlebury?)

知っていた (Yes)	1
知らなかった (No)	4

Q2. ARIS の操作、技術について (questions about technical issues of ARIS)

Q2.1 ARIS をダウンロードしてセットアップするのは難しかったですか。
(Was ARIS difficult to download and set up?)

やさしい (easy)	1
あまり難しくない (not very difficult)	1
適当 (appropriate)	2
難しい (difficult)	
難しすぎる (very difficult)	1

Q2.2 ARIS のプログラムを理解することは難しかったですか。
(Was operating ARIS difficult to understand?)

やさしい (easy)	1
あまり難しくない (not very difficult)	1
適当 (appropriate)	2
難しい (difficult)	
難しすぎる (very difficult)	1

何が難しかったですか。 (Which part was difficult?)

- ゲームを見つけたり、時々プログラムが途中で止めるし。 (Searching for games. programs sometimes stop working.)
- Apple ばかりですから。 (Available only for Apple)

Q2.3 ARIS のプログラムを iPod や iPhone で使うことは難しかったですか。
(Was ARIS difficult to use on iPod or iPhone?)

やさしい (easy)	1
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あまり難しくない (not very difficult)	1
適当 (appropriate)	2
難しい (difficult)	
難しすぎる (very difficult)	1

何が難しかったですか。(What was difficult?)

- Apple ばかりですから。(Only available for Apple)
- たまにうごかない (It sometimes does not work.)

Q2.4 ARIS のプログラムを使った時に、技術的な問題がありましたか。
(Did you encounter any technical difficulty with ARIS?)

全然なかった (not at all)	2
少しあった (a little)	2
どちらとも植えない	
あった (somewhat)	
たくさんあった (many)	1

どんな問題がありましたか。(What were problems?)

- Apple ばかりですから (Only available for Apple)
- スクリーンの流れ (flow of the screen)

Q3. ARIS を日本語の授業で使うことについて (Questions about using ARIS in Japanese language class)

Q3.1 ARIS を日本語の授業で使うのは面白かったと思いますか。
(Did you find it interesting to use ARIS in Japanese language class?)

面白くない (not at all interesting)	1
あまり面白くない (not interesting)	
普通 (OK)	2
面白い (interesting)	2
非常に面白い (very interesting)	

Q3.2 ARIS は日本語の勉強に役に立つと思いますか。
(Do you think ARIS is useful for Japanese language studies?)

役に立たない (not at all)	1
あまり役に立たない (not very useful)	1
普通 (neutral)	1
役に立つ (somewhat useful)	2
非常に役に立つ (very much useful)	

どうしてそう思いますか。(Why do you think that way?)

・先生といしように使えば面白い。(It will be interesting if a teacher is present.)

Q3.3 ARIS を使ってから速読の本を読んだ方が速読の内容が分かりやすくなったと思いますか。

(Do you think ARIS helped you understand stories you read in fast-reading class?)

わかりにくかった (not at all)	
少しわかりにくかった (no)	
どちらともいえない (either no or yes)	2
わかりやすかった (yes)	3
たいへんわかりやすかった (very much)	

Q3.4 ARIS を授業時間以外に使うことについてどう思いますか。

(Do you think it is a good idea to use ARIS outside class hours?)

よくないと思う (not a good idea)	1
どちらでもいいと思う(neither good nor bad)	1
いいと思う (a good idea)	1
授業中に使ったほうがいいと思う (better to use in class)	2

Q3.5 ARIS でどんなことが学べたと思いますか。学べたと思うことに×をしましょう。

(What did you learn with ARIS? Put X on the item/items.)

日本の場所や地名 (names and locations of place in Japan)	4
人物についての知識 (knowledge about famous people)	4
日本についての知識 (knowledge about Japan)	3
単語や文法の復習 (words and grammar review)	2
新しい単語や文法 (new words and grammar)	1

その他 (Others)

・Apple の偏見 (bias of Apple)

Q3.6 ARIS を日本語の授業で使うことについてどう思いますか。

(What do you think of using ARIS in Japanese class?)

よくないと思う (not good)	
どちらでもいい (neither good nor bad)	3
いいと思う (good)	2

どうしてそう思いますか。(Why do you think that way?)

・宿題の代わりに、授業中で使ったらより役に立ちと思う。(It would be more useful to use ARIS in class instead of homework.)

・AIRS を通して、所や人物を紹介しやすいと思います。(ARIS makes it easy to introduce places and people.)

- ・面白いゲームな感じだから、私だったら、授業時間以外に使いたくない。(Since it is like a fun game, I want to use it only in class.)
- ・Apple ばかりですから、Android の偏見です。(Available only on Apple devices.)

Q3.7 ARIS についての感想や意見があったら、書いて下さい。
(Please write any comments and opinions about ARIS.)

- ・Apple ばかりのプログラムはよくないと思う。しかし、内容は結構面白いと思う。(I don't like it is only available on Apple devices, but contents are interesting.)
- 色々な知識がありますから、いいですけど、必要なテクノロジーではない。(It packs various knowledge, but it is not necessary technology.)

Q3.8 ARIS のようなテクノロジーを日本語の授業に使うのは大切だと思いますか。
(Do you think using technology like ARIS in Japanese class important?)

大切じゃない (not important at all)	
あまり大切じゃない (not very important)	1
どちらとも言えない (neutral)	2
大切 (important)	1
とても大切 (very important)	1

どのようなテクノロジーを使ったらいいと思いますか。
(What kind of technology will be useful?)

- ・今、テクノロジーの問題が時々あって、不便。Interface がよければもっと楽しい。(I had technical problems with ARIS. If the interface improves, it will be more enjoyable.)
- ・単語や文法を勉強するため、SNS のようなテクノロジーは役に立つと思う。(Technology such as SNS would be useful for learning words and grammar.)