

Augmented Tourist Information Poster Projects in an English Language Learning Class

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Abstract

This paper documents the process of a group of English language learners working on a project-based tourism course to create enhanced information posters for tourists with augmented reality (AR); an emerging and disruptive form of interactive technology used across a variety of applications and industries. The paper first provides a definition of AR, before exploring AR's applications to tourism resources and language learning contexts. The paper then describes the classroom procedure of creating augmented tourist information posters, before reflecting on the outcomes of the poster projects.

Introducing Augmented Reality

Owing to the proliferation and advancement of mobile technology over the last decade or so, AR experimentations and applications have greatly increased and developed. As a term, AR is quickly finding a place in the common consciousness, with a general awareness of what AR is, and what it entails. AR has been used across many different technological platforms for a multitude of purposes, with a general definition perhaps being difficult to reach. Broadly speaking, however, AR refers to any technology that places digital interfaces into the real world (Mohn, 2015), often integrating digital information with live imagery on the user's environment in real time (Rouse, 2015). Hawkinson (2018) defines AR as "the blending of digital content in and on the physical world (p.34). AR falls within the wider umbrella area of mixed reality (MR), described as any attempt to merge "real and virtual worlds to produce new environments and visualisations where physical and digital objects co-exist and interact" (Young, Sharlin, & Igarashi, 2011, p.2). AR can further be situated along a virtuality continuum (Milgram, Takemura, Utsumi, & Kishino, 1995), residing at a point just beyond the real environment, but not quite as far removed as virtual reality (VR). A well-known example of AR that is used extensively is the smartphone game *Pokémon GO*. Through the use of AR, animated digital characters are overlaid on images of the real life surroundings captured through the game player's smartphone camera, creating the effect that the character is physically present in front of the user on their smartphone screens.

Situating Augmented Reality in Tourism

AR has found favour with the tourism industry, with AR technology being used for a number of different purposes, such as marketing and promotion, research, services, and tourist experiences over the last few decades. The advancement of smartphones has revolutionised the way that tourists interact with the locations around them and access information. AR is proving useful in the tourism industry, owing to the ability to bring knowledge about the environment in the user's vicinity," making the "task more pleasant and effective for the user, since the required information is spatially superimposed over real information related to it" (Danado, Dias, Romao, Correia, Trabuco, & Santos, 2003). Some examples of AR being deployed in tourism include Neuburger and Egger (2018) who explore how AR could be introduced in museums to enhance a visitor's experience and sense of engagement with various items on display. Yovchevaa, Buhalisa, and Gatzidis (2013) put forth a case for how AR could be used to provide marketing opportunities, by looking at how engineers can use AR effectively to tailor content to target audiences to aid and influence decision-making processes. Additionally, Rasinger, Fuchs, Beer, and Hopken (2009) assess the potential of AR for information communication, such as giving and receiving feedback from tourism authorities, and for contact with accommodation and other service providers. In relation to this study, Reitmayr, Eade, and Drummond (2005) looked at how AR could be used to supplement and enhance paper-based maps, by providing timely information, raising meaningfulness, and generating engagement.

Within the context of Japan, AR is slowly but steadily being taken up across different popular tourism destinations to appeal to, and meet the needs of the increasing amounts of inbound international tourists visiting the country. Some examples include *Seven Bank, Ltd.'s Japan ATM Navigation*, that directs users to the closest ATM by superimposing the route on images of the real-world surroundings on smartphone screens. The Japan National Tourism Organization has also created an interactive billboard in which passers-by can virtually try wearing traditional garments such kimono and yukata, through the use of a camera overlaying the costumes on their real world clothing. As this section has attempted to show, AR has a number of diverse applications and uses in the tourism industry, both globally and locally in Japan, and is establishing itself as a key concept both in the field of tourism studies and in the tourism industry.

Exploring Augmented Reality in Language Learning

For teachers working with English language learners majoring in tourism, it could be argued that AR would be a worthwhile content area to bring to the classroom for learners to discuss, experience, and study. Computer and mobile technology are ubiquitous in the language learning classroom of late, and now play an influential role in the learning process. While movements towards computer-assisted language learning (CALL) and mobile-assisted language learning (MALL) represented a paradigm shift at the time, developments in mixed, augmented, and virtual realities (MAVR) could be said to represent

the next. Early empirical findings into the effects of using MAVR suggest that techniques, such as augmentation, may lead to a raised understanding of content, better memory retention, improved task performance, and increased student collaboration and motivation (Radu, 2014). Yet, it could also be argued that AR technology and the like, may still be at a formative stage with regard to language learning and the wider field of education (Chen, Liu, Cheng, & Huang, 2017). However, there are a number of ways that AR has been identified as being used in language learning settings (Godwin-Jones, 2016). For example, Perry (2015) examined the effects of using an AR-based game with a group of French language learners, preliminarily finding that participants engaged meaningfully through the interactive gamification process. AR has also been used to supplement, enliven, and update printed textbook materials for language learners, such as Hawkinson (2014). Others have used AR to aid and support vocabulary acquisition, with Solak and Cakir (2015) experimenting with AR for the pronunciation of new vocabulary items, and Li, Chen, Whittinghill, and Vorvoreanu (2014) using AR to generate flashcards for Chinese learners of English. As will be exemplified later in this article too, the use of AR allowed the learners to embody the content they were representing, for example, instead of simply drawing, speaking, and writing about cooking instructions and directions, the AR affords learners the chance to record videos using their smartphones in order to enhance two dimensional words and images.

In summary, for learners studying both tourism content and second languages, one could argue that AR would be a useful area to explore with learners in the language classroom, given its growing position in the tourism industry, and as a general reflection of broader paradigm shifts towards MAVR in educational settings. In the section that follows, a pilot course undertaken by the writer and his groups of learners will be detailed, whereby AR was used not only in the classroom as part of an English language learning project, but also as learning content in relation to the specific area of tourism.

Course Setting

The writer introduced an AR poster project to four sets of second year undergraduate learners studying on a compulsory English language course in an international tourism faculty in Japan. The project described in this article was the final of three course projects, with the first based on designing overseas package tours, and the second focussed on researching and presenting about regional tourism trends in Japan (Turner, 2018). The project took place at the end of the first of two semesters in the academic year, between the summer months of June and July. The project followed a five lesson cycle from start to finish, with the final class acting as both a formal assessment of his learners' production, and a chance for each group to demonstrate and experience each other's interactive posters. The procedure section that follows this part will explain each step in the project's cycle in more detail.

Students were arranged into groups of three to five members in the first lesson of the project cycle, with all members being expected to contribute to different aspects and stages of their poster's design equally and actively. The learners were encouraged to download an application on their smartphones that

would allow them to create AR videos. The writer explained to his learners that they were under no obligation to do so, should they wish not to. Groups were rearranged accordingly to make sure that each set of learners had access to the application on at least one smartphone per group. Further information will be explained about the application in the following section. In the final lesson of the project cycle, each group of learners verbally agreed to have their poster displays video recorded by the writer. The learners were made aware that the purpose of the video recordings were to aid in the evaluation and assessment process, capture the interactivity of their posters more accurately, and potentially be of use in the writer's own future research. Selected images from these videos will be presented later in this article.

Project Procedure

This section will provide an overview of the five lesson project cycle, explaining the aims, outcomes, and content of each lesson. In the section that follows this, examples of the learners' posters will be presented and explained.

Lesson One

In lesson one, learners were introduced to the concept of AR. By way of a warm-up to the class, learners were asked to consider and talk about how they thought mobile technology, such as smartphones, had changed and impacted upon modern tourism. Learners were also encouraged to think about how their own smartphones could be used to support themselves as tourists, so as to provide the learners with different perspectives on mobile technology's role in tourism. Following this, the learners were introduced to AR through the combination of a short reading passage and some accompanying images. The reading passage was selected from John (2018) and adapted to suit the learners' English language levels, and presented as follows:

Augmented Reality (AR) is a type of interactive, reality-based display environment that uses the capabilities of computer generated visuals, sounds, text, and effects to enhance a real-world experience. AR combines real and computer-based scenes and images to deliver a unified, but enhanced view of the world. Computer-based images are overlaid on real-world images.

In the passage, vocabulary items such as 'enhance, capabilities, interactive, overlaid, unified,' and 'combines' were selected for focus, with learners asked to match these terms to the corresponding definitions. Following the reading and vocabulary activities, the learners were asked to retell the information to their groups, so as to ascertain whether the learners had understood the concept of AR and the vocabulary in tandem.

Once the definition of AR had been introduced to the groups, the learners were asked to think about

AR-related issues by way of discussion. In order to aid their discussions, functional language phrases were introduced. Functional language phrases are defined as conventionalised ‘chunks’ or expressions used in common communicative situations (Widdowson, 1989). In relation to this lesson, the communicative situation was an exchange of opinions in a discussion, with learners being introduced to opinion phrases that further express certainty and uncertainty. As AR is a disruptive and emerging form of technology, learners were asked to consider if it could be dangerous, how it will affect the way we interact with the world, and what impact it could have on younger children. Learners were encouraged to use phrases such ‘I feel sure that’, and ‘I could be wrong, but I think’, to express certainty and uncertainty about the general implications of AR.

Having been introduced to the concept of AR, and facilitated learners’ discussions on AR, the groups were then introduced to some general AR applications across different areas of life. Learners reflected on images of AR in use, with examples such as how AR has been used for design, commerce, and gaming purposes being presented. This section set up the learners’ first homework assignment, which was to independently research how AR has been used specifically in the area of tourism.

Lesson Two

In this lesson, learners were encouraged to think about the links between AR and tourism, through being introduced to examples of tourism applications of AR, before being given time to discuss and plan their own ideas with project group members. The lesson began with learners reflecting on their homework assignments from the previous week. Learners had researched AR’s uses in the area of tourism and each brought examples with them to class. Learners were asked to share their findings with their peers and take notes on what other members had found out. Surprisingly, the learners had found a diverse range of examples of AR in tourism, allowing for an even richer and wider understanding of the technology and its uses.

Having shared homework findings with one another, learners were then asked to read about some further examples of AR uses in tourism. A report by Buhalis and Yovcheya (2013) was selected for use, given the breadth of the ten ideas the writers detail in their study. Each of the ten examples was set up as a reading station at different locations around the room, with the learners assigned three minutes to read each one. Following their reading of each example, learners returned to their groups and shared what they had read with their other group members. The learners were asked to summarise the reasons for the AR’s use, describe how it enhances an experience for the tourist, and share their personal opinions about the examples.

In a similar approach to lesson one, learners were then asked to discuss their ideas for how to support tourism by using AR. Learners were introduced to functional language phrases to help them express their ideas, and ask others for their ideas in discussions, with phrases like ‘does anyone have any ideas?’ and, ‘one idea could be,’ aiding this. The learners discussed how AR could be introduced to places in public where tourists might require support and help in Japan, such as in restaurants, train stations, sightseeing attractions, and shops.

In the final stage of the lesson, learners began to compose proposals for their poster projects, and were asked to explain and justify the type of guidance or support they would like to offer tourists with their posters, what information will be shown with AR, and what tourists can experience through the use of AR. The learners finished their proposals as their second homework assignments.

Lesson Three

The aim of lesson three in this project cycle was to familiarise the learners with the technology that they would be using to enhance their posters with the use of AR. The lesson started with groups of learners downloading the chosen smartphone application, which in this case was *HP Reveal*. This application is a free application that allows users to create images or videos to be overlaid and superimposed on real-world views on smartphone screens. Users establish a trigger by taking a photo of something in their immediate surroundings. Once a trigger image is established, users can then superimpose another image, video, or animation atop their trigger image. For example, in the case of this lesson, an image of the writer on the projector screen, triggered a previously recorded video of the writer, which the learners' could see on their smartphone screens. *HP Reveal* was chosen for

use, owing to the writer's familiarity with the application, and having attended a demonstration on how it could be applied to a language learning setting. Following this, the learners spent some time setting up private and anonymous accounts on the application and testing the application around the classroom.

For the remainder of the lesson, the learners were asked to create practice posters as a way to get used to using the application. Learners were tasked with creating information posters about their university for visitors. The learners chose five topics that they wanted to talk about, these ranged from building names and locations, points of interest around the campus, cafeteria information, and faculty-specific information. Using the template detailed in Fig 1., the learners then created five trigger sketches to represent their points.

On completing their five sketches, the learners then recorded videos on their smartphones to explain their poster items. At this stage, some groups of learners decided to venture around campus in order to capture videos at different locations, while others chose to verbalise their content by talking into their smartphone cameras. On completing their content, the learners then linked their videos to their trigger

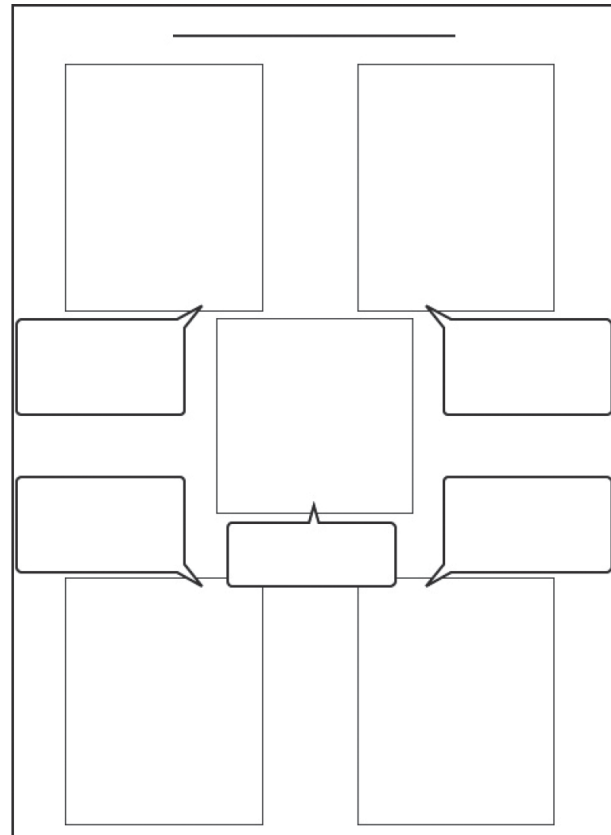


Fig 1. *Template for practice AR posters*

images and displayed their posters for other project groups to try out and experience. The class culminated with the writer confirming their project proposals that were completed for the previous lesson's homework assignment.

Lesson Four

This lesson saw the learners working on their posters in a self-directed manner. Learners were responsible for deciding on how to use the class time, with most groups staying in the classroom and designing their posters with each other, preparing videos to be used as their AR examples. Some groups decided to record and make videos around the university campus, some groups went to a quiet location to record voiceovers for their videos, and other groups made plans to go further afield around the city in their own time. The writer was on hand to answer any questions about the production of their posters, offering both content and technical support. The groups were made aware that the following class would be an assessment lesson, and that posters would need to be completed before this time.

Lesson Five

In this lesson, groups presented their posters to other groups, by giving interactive demonstrations of their AR posters. The lesson was divided into two parts, with half of the learners acting as demonstrators, and half of the groups moving around the classroom experiencing the posters, with these roles later being reversed. The groups each had five minutes to demonstrate their posters, in which they were required to use the target language of English at all times and provide a commentary on their poster designs. Aided with smartphones, each group showed a visiting group how to use their posters, and allowed the visiting group to try them out. As groups interacted with each other about the different posters, the writer made his way around the room with a video camera, capturing examples of the posters being used interactively. Screenshots from these videos will be presented in the next section.

As mentioned previously, this lesson also functioned as an assessment lesson. With Learners' projects were assessed on the following five criterion:

- Informativeness – The quality and depth of the posters' information
- Creativity – The level of creativity of the posters
- Enhancement – How the AR enhanced the posters
- Usefulness – How useful were the posters for tourists and related users
- Teamwork – How cohesive were the posters in terms of design and collaboration

Each criterion was scored on a scale between one to four, with one being the lowest point awarded, and four being the highest. Learners were given scores corresponding with the rest of their project groups. The criteria presented here was decided upon to take into account not only the learners' level of quality with regard to their posters, but also to assess the extent of which the content of the class, in this case AR for tourism purposes, had been appropriately understood, initiated, and engaged with. Scores

were awarded by the writer through a combination of reviewing the videos that were recorded, and by writing notes in the lesson itself as groups of learners demonstrated their posters to other project groups. The criteria presented here was conceived of by taking into account a content and language integrated learning (CLIL) approach, as detailed in Ball, Kelly, and Clegg (2015).

Towards the end of the lesson, learners were encouraged to reflect on the project, by responding to an informal anonymous survey provided through the university's own online platform. Feedback from these learner reflections will be briefly detailed in the following section.

Project Outcomes

In this section, selected examples of the poster projects will be presented. To accompany the examples, screenshots taken from the writer's video recordings will be presented, in order to show how the use of AR works to supplement and enhance the tourist information posters that the learners created.

Examples of the Learners' Posters

In total, there were approximately 26 posters created across all of the writer's groups of learners. Poster purposes were diverse, ranging from posters offering information to potential tourists about the Tokyo train network, how to behave and act when visiting temples and shrines, to information about specific tourist attractions. Fig 2. presents two images of station signs, with instructions for the user to scan the sign using their smartphone.

When the user scans the trigger image, in this case the image of train signage, a short video giving users more information about the train stations location and surrounding points of interest is revealed and superimposed.



Fig 2. Poster Example 1 (pre-AR effect)

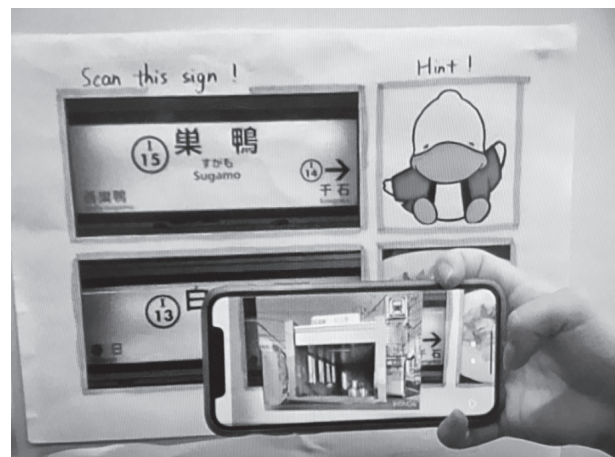


Fig 3. Poster Example 1 (AR effect)

For potential users of this poster, this display offers the chance to get dynamic information that may otherwise be difficult to convey strongly on a static and two-dimensional poster. AR arguably supports the tourist in this case by offering more meaningful, memorable, and realistic information that the user could readily act upon. AR also gives the poster user an added level agency as to which particular details they would like to use their smartphones for to find out about further.

In the next example, the project's group decided to gamify the way that tourists could receive and learn about local information, by creating an interactive board game. The users were given clues, and with the use of their smartphones, were tasked with finding the corresponding information.

In the case presented below, poster users read the written information about a particular sightseeing spot, and with the use of their smartphones, located an accompanying image that would trigger the AR effect.



Fig 4. *Poster Example 2 (pre-AR effect)*



Fig 5. *Poster Example 2 (post-AR effect)*

This use of AR exemplifies the potential for making tourist information posters more memorable, interactive, and appealing. By creating an information poster or leaflet that requires the user to act upon place specific information prompts, potential tourists may be more likely to visit particular sites, with these places being able to develop a positive and dynamic image. This use of AR makes the act of receiving information more engaging, exciting, and challenging.

In the final example shown in Fig 6. and Fig 7., AR has been used to offer cooking instructions to potential users. Cooking instructions require details related to movement and ingredients, which may be difficult to show on a static poster or leaflet.

The learners decided to record their own cooking videos to explain and exemplify each stage of a cooking process. Like with the other two examples shown here, the AR supported and enhanced the posters content, made it clearer and easier to follow, and could perhaps have left a stronger impression for people interacting with the poster.

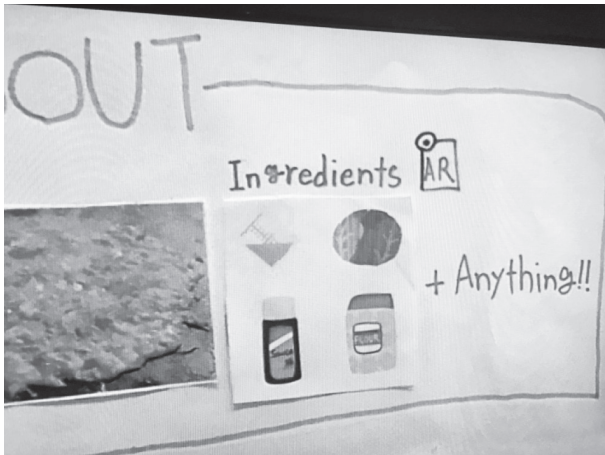


Fig 6. Poster Example 3 (pre-AR effect)

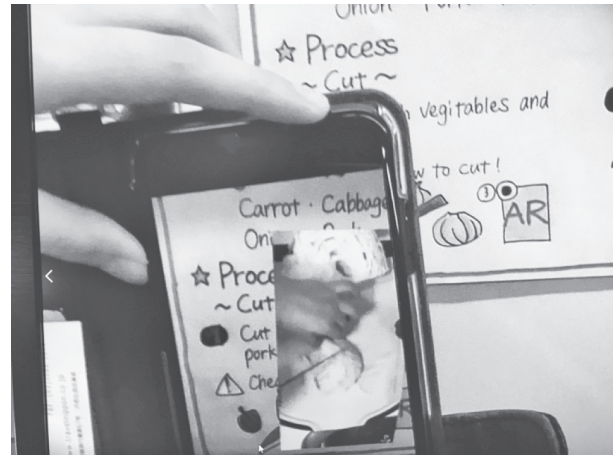


Fig 7. Poster Example 3 (AR effect)

The Learners' Reflections

Learners responded in a positive manner to this project. In general, a majority learners were already aware of AR's role and position in the tourism industry, and were subsequently interested to experiment and try it out for themselves in class. Other learners remarked how the use of AR videos made content that would perhaps be difficult for tourists to understand through written word or still image only, a lot easier. With regard to working with other learners in a project-based approach, some responded that the use of AR helped them to learn how to cooperate with others better, recalling how engaging they found the process of directing and recording videos together. With regard to tourism, a number of students commented that AR affords the ability to realistically represent important information that tourists need to know, such as certain behaviours and actions related to visiting a shrine or temple in Japan. Finally, some learners reflected on the convenience of using AR, and how most modern smartphones have the ability to trigger AR imagery, thus opening up a range of opportunities in the world of tourism.

Conclusion

This report has explored the potential of using AR in an educational context. As was previously described at the beginning of this paper, AR is positioning itself as an influential and important tool in the tourism industry. Similarly, AR, as well as other forms of mixed reality technology, is also finding uses in language learning situations. In this pilot course, learners responded positively to use of AR as both a focus of content, and as a way to make use of, and operationalise the target language of English. Through using AR, learners were able to act collaboratively with their project group members, and create informative, interactive, and engaging tourist posters for their peers to try. In the same way that AR is being adopted as a way to enhance tourism resources, AR also has the potential to enhance and enliven language learning classrooms.

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英語クラスで拡張現実感観光情報ポスタープロジェクト

ターナー・マシュー

[要約]

本論文では、プロジェクト基盤の観光コースで学ぶ英語学習者の授業の経過を報告する。授業内容は、さまざまなアプリケーションや業界で使用されている、新しく多大な変化をもたらす技術である拡張現実感（AR）を取り入れた、観光客向けの詳細なポスターを作成することである。最初に AR の定義を解説し、観光資源と語学学習への AR の応用を説明する。次に、拡張された観光情報ポスターを作成する指導法について解説し、ポスタープロジェクトに関する授業内容の成果について考察する。