# Theoretical Framework

Theoretical Framework

According to Pine and Gilmore (1999), the experience can be categorized into four parts, namely entertainment, educational, esthetic and escapist experience with different extent from the passive to active and absorption to immersion. While delivering a tourism experience with higher absorption, adequate information needs to be provided for the visitors. AR may facilitate the delivery of entertainment and educational experiences.

Figure 17: The Experience Economy
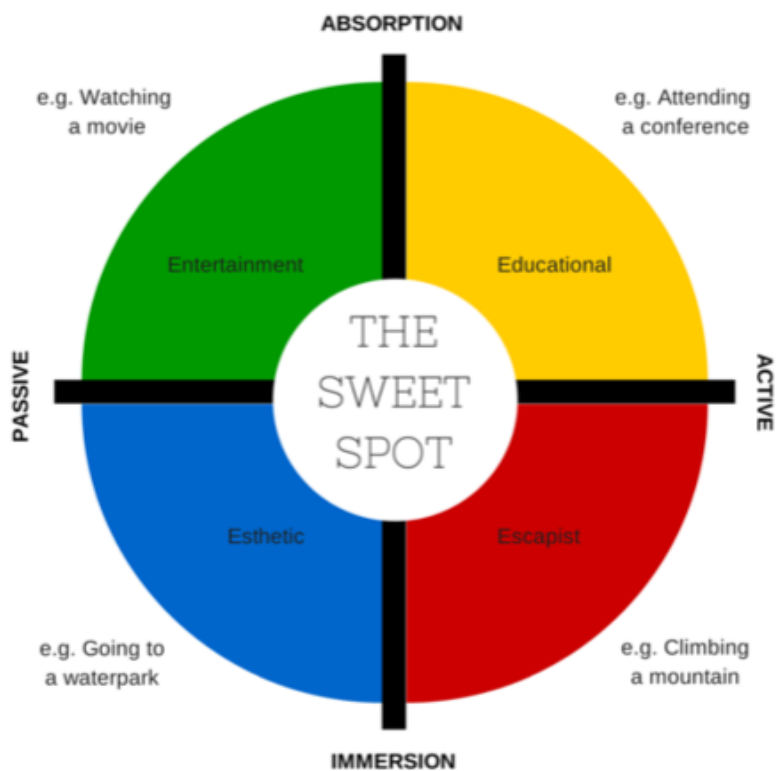
In the experience economy model, AR sector can be used in the educational quadrant. Firstly, when it comes to the ordinate, AR experience is more absorptive than immersive. According to the definition of absorption, which means "occupying a person's attention by bringing the experience into the mind"(Pine & Gilmore, 1999), aligning with the outcome of AR experience. This is because people who use AR App probably focus on the screen of mobile devices so that they are able to get information from AR App. Then, the AR users also may like adopting App proactively than passively. It may also be affected by the offering which directly determines the attractiveness and interactivity of AR experience. Hence, from active and absorption perspective, the educational function is referred to one of the mostly used functions of AR experience, which has been applied in museums and historical attractions globally. By using AR, visitors can increase skills and knowledge through absorbing information presented in an interactive way (Oh, Fiore & Jeoung, 2007).

Theoretical Framework

AR technology can superimpose the information and image to enhance the real-world environment. It gives the chances of providing more information for the visitors to absorb. It fills the gap of the limited physical space for interpretive signage, and also reduce the restriction on time – the visitors may watch an augmented video every time they like onsite without bothering others, start a new era of storytelling. These potential advantages attract people to explore the possibilities left in AR application in the tourism industry.

On the other hand, according to Hofstede's cultural dimensions (2000), cultural differences include four dimensions, namely masculinity/femininity, power distance, individualism/collectivism, and uncertainty avoidance.

Figure 18: Cultural Dimensions
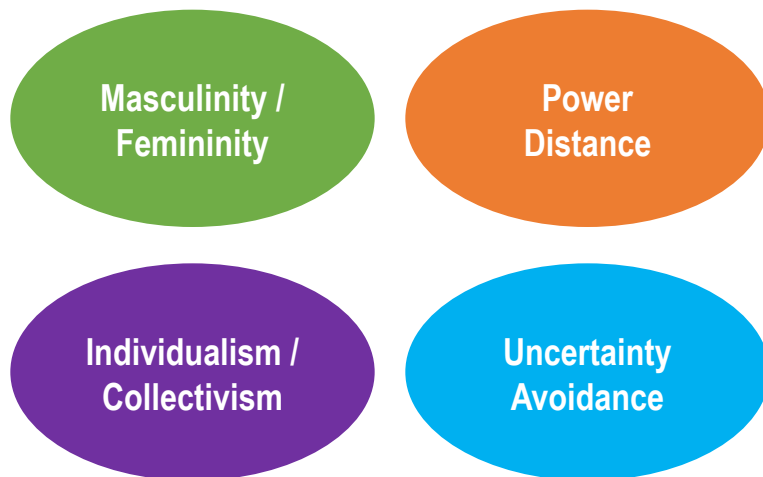
According to Jung, Lee, Chung and tom Dieck (2018), those people who share high power distance, collectivist and high uncertainty avoidance culture may have a stronger dependence on social influence and the hedonic characteristics of AR. The cultural dimensions positively influence visitors' perceptions on AR. This indicates that when targeting tourists from the above type of culture dimensions, the design needs to focus on creating more enjoyable, engaging content which is socially accepted (Jung, Lee, Chung & tom Dieck, 2018). As different cultural backgrounds may have influence on how to design the AR Apps to facilitate visitors' onsite experience. A closer look on Chinese visitors' perceptions is needed.

Methodology

Methodology
Research Design

This project objectives are to identify the current trend of AR Apps, investigate the attitude of Chinese visitors on utilizing AR Apps to facilitate visitors' onsite experience, and gather a deeper understanding of AR application in Queensland. The project adopted a qualitative approach to collect data.

Focus groups, one-on-one WeChat interviews and consultation with AR innovation team were conducted to acquire understandings of AR from different perspectives.

Firstly, a consultation with the Innovation team from the Department and AR industry was conducted. During the one hour consultation, the team mainly gained the current advanced information of AR as well as the knowledge of the barrier and dilemma of AR applications in reality.

Then, focus group was selected because it encouraged interaction and stimulates ideas (Veal, 2011). The research team was able to explore beyond the bounds of tightly worded questionnaires, which aligns with the research objectives. Therefore, two focus groups were conducted, and each one consisted of six participants. The focus groups were well standardized and structured. The length of each focus group was 40 to 50 minutes according to the content of questionnaire, and each focus group includes at least one interviewer and one facilitator to underpin the entire process.

Two separated WeChat interviews were conducted after the conduction of the focus groups. The semi-structured interview was used as it provided a flexible structure which allowed changes and probe during the interview while conversation theme remains on track. The WeChat interview questions were designed and advanced based on the finding of the focus groups. Finally, combining the results of focus groups and interviews, the perceptions of Chinese visitors towards QLD and AR Apps utilization were identified and summarized.
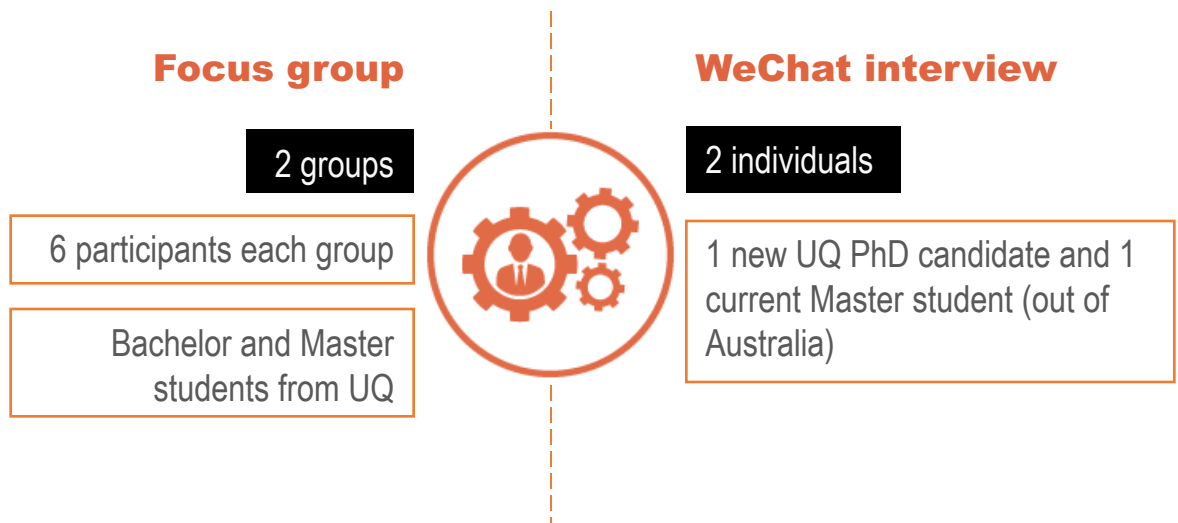
Methodology
Sampling Technique

As demonstrated before, China remains the top international market for Queensland tourism industry. The insights from the Chinese perspective is needed to maximize the profit brought by applying AR technology on developing visitors' onsite experience. Among Chinese markets, Chinese millennials are identified as one of the groups that may be more interested and familiar with AR. Thus, the project is conducted focus on this segment.

Two focus groups are conducted to analyze the reactions and interaction of participants by open discussing specific questions. In this case, the two focus groups consisted of eleven postgraduate students and one bachelor student. Most of them are majoring in Tourism, Hospitality and Event Management, which means they could provide their inspiration from a more professional perspective. The other three participants, one from engineering science and two from economics, enable the research team to gather more insights from various fields.

The participants in the focus groups have already stayed in Queensland for at least 1.5 years, which means they have a better understanding towards the state. On the other hand, the two interviewees chosen have relatively less knowledge towards the state (one of them only stay in Australia for 2 months, and the other one never came to Australia before). Their thinking might be closer to the ordinary Chinese tourists to a certain extent. The geographic details of the focus groups participants and the interviewees are demonstrated in Figure 19.

Focus group

2 groups

6 participants each group

Bachelor and Master students from UQ

WeChat interview

2 individuals

1 new UQ PhD candidate and 1 current Master student (out of Australia)

Methodology
Sampling Technique

The red marks reflect the focus groups participants' origin while the blue marks reflect the interviewees'. The size of the mark reflects the difference in participants' number from that province or city. The geographic information indicates that the conducted focus groups and interviews reflect the diversity of the opinion from different geographical origin to some extent.

The participants and interviewees all come from the urban area of China. The geographical profile basically aligns with the origin of Chinese visitors who might come to Australia – most of them come from the provinces sit alongside the east coast of China. Those provinces are also known for having a relatively high level of economic development.

Figure 19: Geographic Origin

● Focus group participants' origin

● Interviewees' origin
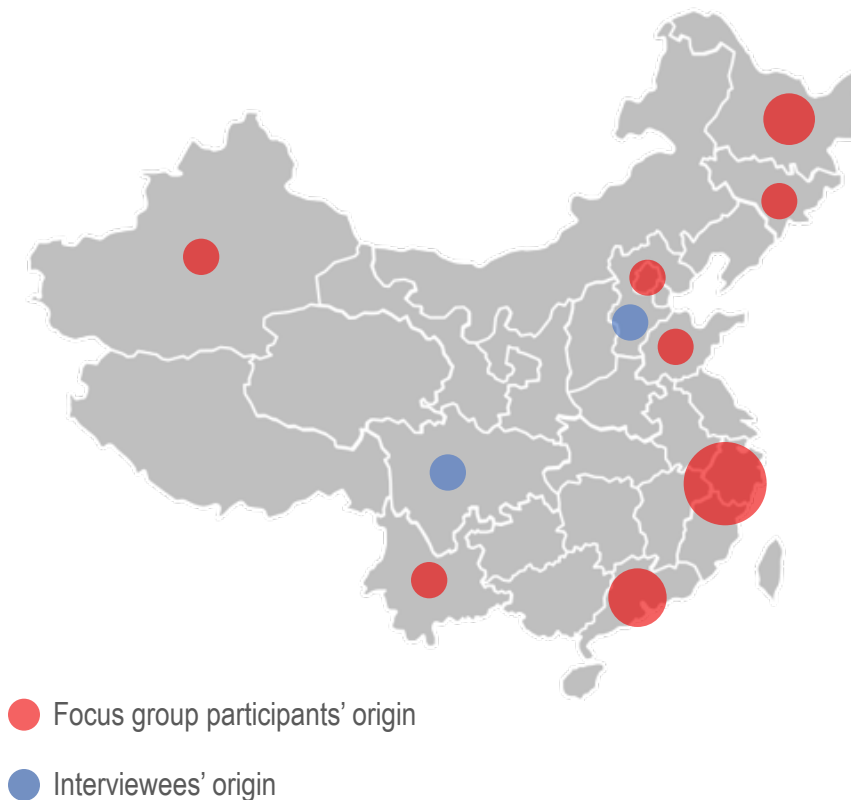
Discussion

Discussion

## Consultation with Innovation Team

By consulting with the Innovation team from the Department, the broad ideas around AR technology and a general depiction of AR application in QLD were outlined. As discussed by the technical expert, several considerations around AR exist and some of them may limit the AR application especially outdoors. For example, the strong sunlight and current technical challenges such as tracking the object indoor would significantly influence the accuracy of location-based AR Apps. He also indicated that the supporting technology for AR implementation is also important. For instance, the 5th generation wireless systems (5G) may assist AR technology in terms of increasing accessibility.

Discussion

Based on the transcript of the focus groups and interviews, content analysis is carried out. The content analysis framework is demonstrated below and the words highlighted in red are the content of the interview added based on the finding of the focus groups.

Figure 20: Content Analysis Framework
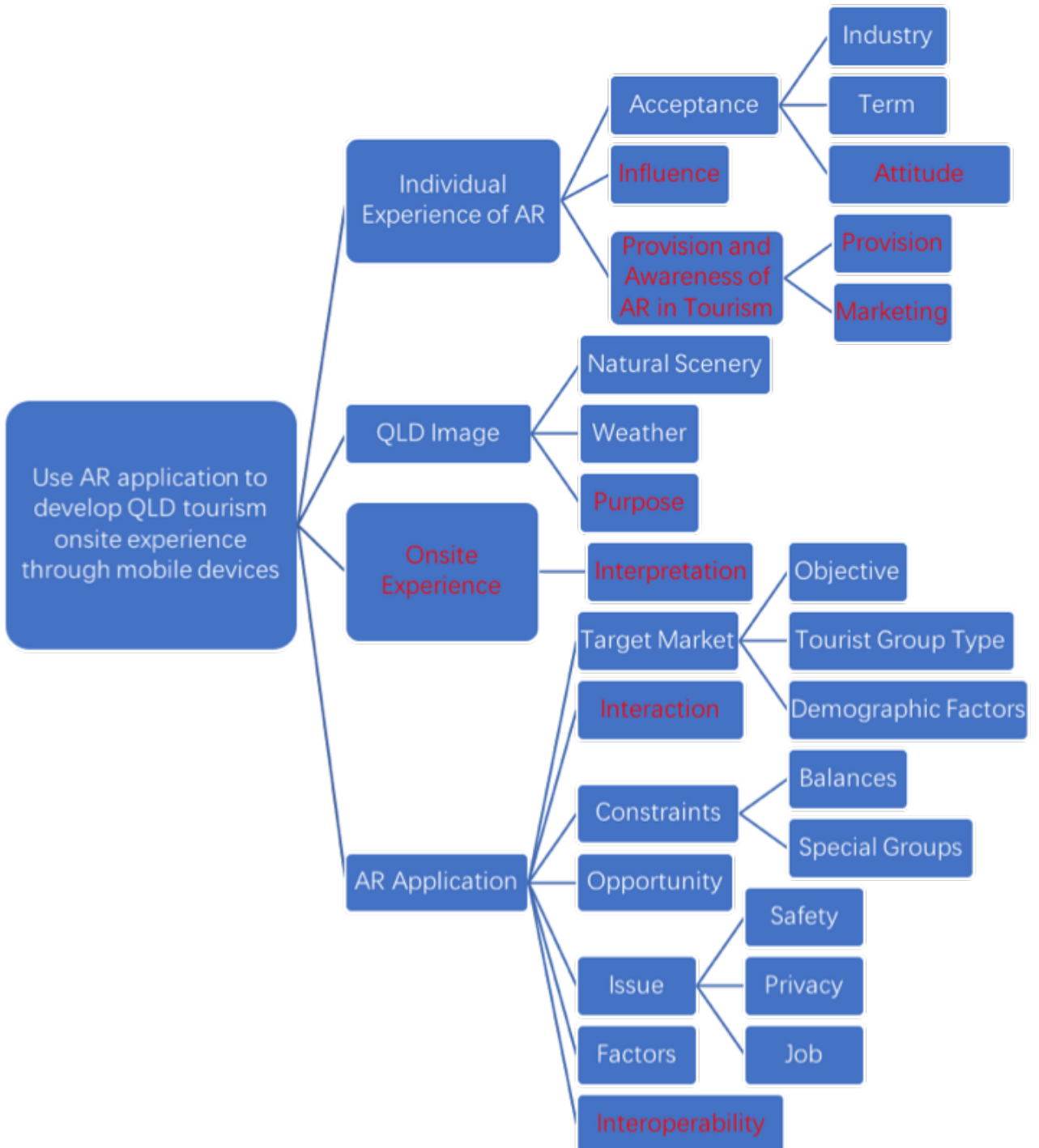
Discussion

● The Awareness of AR

Although AR has been increasingly used in life, some participants do not realize they had experienced it before. For Group 1 (g1), most participants were not familiar with the **term** Augmented Reality, and the definition of VR and AR. However, after they were taught what AR is, they were able to provide plenty of examples they had used from **different industries**. For Group 2 (g2), each participant shared his or her experience with AR Apps, covering gaming, retail, payment, photo taking, etc.

On the other hand, Based on the interview, both interviewee 1(i1) and interviewee 2 (i2) had some knowledge about AR, which was different from the focus group. Both of them mentioned that they learned AR related knowledge from the Internet, and they knew AR as a technology before they tried an AR App. It could be seen as an independent self-learning process which influences the AR App awareness. At the same time, i(2) also mentioned that the acceptance of AR was quite wide and positive as she knew many of her friends play Pokémon Go. The **peer pressure** might push more people to use AR Apps. Thus, when applying AR Apps to attract Chinese tourists, the tourism operators can utilize these characteristics to further facilitate the process.

Generally, the focus group participants expressed a **positive attitude** toward AR products, especially the AR in the tourism sector. Some participants thought some sorts of AR Apps are useful for them, which meant they believed AR could improve life quality and the convenience to life. Although a g(2) participants concerned about physical safety issues as well as information and privacy safety issues caused by AR, she thought it would not be an problem when it turned to tourism. AR could be a good method to deliver specific messages and information that benefit the visitors. Although there are differences between i(1) and i(2) on whether they used AR Apps before, they also expressed certain **acceptance** on AR technology, which aligned with the focus group findings. To take a further step, they specifically touched on the **novelty** image of AR technology which was not mentioned by focus groups, and showed their willingness to understand and try this new technology. It can be seen as an opportunity for the AR Apps in current situations.

Discussion

Based on the discussion, it seems that few of the participants tried tourism AR Apps in China, but some of them were aware of the Apps used worldwide. G(2) participants gave the reason that "I did not download and use the AR App because I may have limited roaming data and the shortage on）storage in my mobile phone". However, they did not doubt that AR is useful in terms of enhancing visitor experiences. The awareness was also mentioned by i(2) from another perspective, saying "I am not sure whether (the fact that) I never use the tourism App is because the attractions do not **provide** such services, or I am not **aware** of the existence of the App." According to the findings from the focus group that the people were not quite familiar with the term AR, AR Apps might be used by Chinese people without being aware. Thus, the entities who are trying to use AR to attract tourists may need particular approaches to market the application of AR technology.

● Image to QLD

As a famous tourist destination, the first image of QLD that comes to all participants' minds is **natural scenery**. It is also considered differentiates QLD from other states in Australia. The participants mentioned several famous attractions, for example, **the Great Barrier Reef**, Gold Coast, and Sunshine Coast. A participant of g(2) also mentions the **hot weather** of QLD. Thus, the AR App designer should think more about how to connect the experience to the unique natural-based environment.

The keyword cloud developed based on the focus groups is demonstrated below (see Figure 21).The larger the word is, the higher frequency it is mentioned by the participants.

Figure 21: QLD Image - Keyword Cloud

Discussion

The interviewees' image to QLD aligned with the focus group perceptions. I(2) added an image of "a good destination for spending Chinese winter holiday (leisure purpose)" from the purpose perspective.

A g(1) participant talked about designing an AR App with explorative contents for the tourists. She thought it would be beneficial for image reinforcement of QLD. However, another opinion on this idea goes to the **conflict** between the QLD image of adventure and AR Apps. G(2) participants stated that "For visitors who come to QLD, people prefer enjoying the road trip rather than using mobile Apps, and the subsequent benefits and challenges may occur." However, this issue still depends on the nature of the attraction and how AR App is developed and used onsite. For example the g(2) participants thought "Sometimes, it will be strange to work the AR App in natural attractions if some incompatible element is added to the natural scenery. However, in terms of visiting the natural scenery, AR App maybe applicable to adjust the angle or distance when their site is not very ideal to appreciate the view because of crowds or bad weather."

● Onsite Travel Experience

The topics developed in the discussion were all around the interpretation.

Firstly, the concerns went to **storytelling**. g(1) participants emphasized that they might focus on the presentation of travel-related information. For instance, they would like to know further information and knowledge such as geological formation, botany, climate and ecology in interesting ways. The participants sought for **diverse and integrated interactions** between the App and the user. One of g(1) participant stated that "The process of just scanning the attraction with the information popped up is relatively boring." It is necessary to think about how to present the information vividly since the AR App can be a good platform.

Another concern is about **the navigation or way-finding**. Although it might overlap with the map App such as Google Map, the participants agreed that it was necessary for a specific group of people. G(1) participants stated that: "For mass tourism, the major attractions are determined, especially for those large tour groups, and the way-finding function in those attractions is more important." Also, it needed to show the direction of the specific facilities in an attraction as well. The AR App may need to provide virtual directions with arrows on the mobile phone to guide the tourists. The g(1) participants thought "Using a celebrity or character can be easier compared to just the map." It will help better promote the AR App, and also introduce a better experience during the navigation. Having someone pointing at the proper direction may also give the user a clearer understanding on finding the correct way.

Discussion

In the interviews, i(1)'s unfamiliarity in a new city led to the desire to have someone or something to guide him and teach him about the intangible culture and customs. This be seen partly as the storytelling. The increased knowledge can reduce the **perceived uncertainty** of the tour experience from the visitors' view, which will increase the feeling of being safe. The possible negative impact caused by the strange environment will decrease. I(2) shared her experiences of visiting two museums in European countries. The first experience was about getting lost in a museum, which was caused by the ill-defined **signage** and the poor **navigation**. The other one was about the limited quality of the exhibits' commentary, which was resulted from the ill-designed **signage** as well as the inadequate **storytelling content**. Although both i(1) and i(2) shared relatively negative experiences, they held quite positive ideas that the dilemmas could be solved with AR technology. I(1) thought the combination of historical and real-life content could be achieved with the involvement of AR Apps, which could give him a better understanding of the city. I(2) discussed the problem from Geo-information System (GIS) perspective, stating that "GIS is available for both outdoor and indoor operation, and the specific function called LBS (location-based service) can combine navigation function with AR Apps, which can solve the problem of getting lost."

● AR Application

Based on the answers from both focus group activities and interviews, the ideas were shared by the participants about enhancing onsite travel experience through the application.

One of the examples given by g(1) participant was to apply AR Apps into small-size boutique tours. To these specific groups, for those who especially focus on the meteorology and phytology, they can use AR App to gain the information better. On the other hand, g(2) participants believed that demographic characteristics of the market should be taken care of. It is essential to **design the AR Apps target to different market**, because it can effectively promote the Apps to people who need it and best satisfy the user's need. The demographic, geographic and behavioural characteristics will all impact the acceptance of the AR App.

As for the potential issue caused by AR, most opinions were positive and optimistic about **AR technology will not replace the real tour guide**. One participant gave us an example of gaining unique experience from old Beijing residents who told the story of the city in the Forbidden City. As the participant said, "People have spirit and culture in them, which cannot be replaced by e-guides."
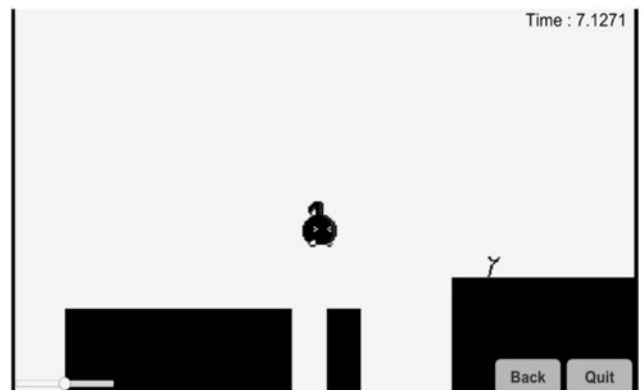
Discussion

The interviewees considered this question from another angle, stating that "the current **technology** is not prepared well to deliver such a sophisticated experience", as "AR currently cannot provide real-time answers to questions, which is easy for a real tour guide". The concern also went to the physical facilitation of the tour guide provided to the special groups such as the seniors and disabled people.

For the AR opportunities, there were mainly two different opinions from the focus group. One was **finding a good balance with the actual scene**, which meant it should not distract tourist's attention on the real scene. AR seemed to undertake an auxiliary function to fill the gap between it and public' perceptions. Another opinion was about AR **offering an entirely new experience for tourists**, such as simulation of the process of bungee jump for people with acrophobia. However, g(2) participants mentioned that they would worry about the safety issue of AR Apps. For instance, when considering using AR applications to project the information to the front windshield of a car, it would be very dangerous for the driver to see the virtual image appear in front of the car when they are driving.

For AR applications enhancing tourists' onsite experience, the interviewees shared some similar ideas with the focus group, but some differences also exist.

Regarding the road trip, i(2) thought "The application might distract the driver, but as they enjoy driving themselves when travel, which always indicates that there will not be only one driver, the information can be projected on the windshield only to the co-pilot so that the safety issue won't occur." Since one of the focus groups questioned the interaction between AR Apps and the user, i(2) also put forward an interesting idea of voice control. An App called *Eighth Note* was very popular in China which uses voice volume to control the movements of the character in the game. Though the feasibility still needs to be tested, it is a possible solution to diversify the way of the interaction between the App and the user.

Discussion

Furthermore, the focus group participants thought **AR application would not be a pull factor to attract them to visit an attraction**, but someone may be attracted to visit there next time if the App is interesting and attractive. Onsite experience is still the most important thing in their mind. The interviewees held different ideas as i(1) thought it was possible for him as he focuses on on-site experience, while i(2) thought AR App existence would not be a single pull factor to motivate her to visit an attraction.

Considering **the factors** that might influence AR application, the participants provided us diverse ideas. The keyword cloud on this specific question is demonstrated below (see Figure 22).

Figure 22: Influential Factors - Keyword Cloud

The focus groups participants and interviewees had conflicting ideas around **downloading issue** and this may due to people's different attitude or opinion towards tourism and the technology.

Some people considered that they would not download AR App on site even relevant AR App signage is presented, because visitors from China cared about the data they use as well as the download speed. Though some of the attractions provided free Wi-Fi, they thought it was not convenient for them as individual identification was required. Besides, they thought standing in front of the entrance or visitor centre to download AR App seemed silly. They preferred starting their visit as soon as possible when they reach the destination instead of wasting time to download any Apps.

Discussion

Other people hold the contradict idea, as they think as long as fast speed Wi-Fi is provided, they are willing to try the App. They consider AR App as a very efficient way to get more knowledge, and they may include the App as part of the tourism experience. While traveling to a new destination, they are willing to try different things to create a memorable experience at their own pace instead of hurry to the next place.

Some participants mentioned that the **interoperability** of AR Apps will be more attractive than other Apps with a single function, because it could save both time for download and storage space for phones. They talked about integrating the function with the social media platform and developing all-in-one App to facilitate the process as well.

The interviewees' ideas partly aligned with the focus group participants. For the interoperability of the App, both of the interviewees were willing to have an all-in-one App instead of managing Apps separately. However, they prefer downloading new Apps instead of using the function based on a social media platform. I(1) focused on novelty, while i(2) concentrated on the experience delivered by the App which could not be achieved by a simple platform. Also, i(2) provided some possible solution on the App design: "There are two different types. The first one is providing an App informing the users that different attractions have different Apps, and you may be directed to a new website to download. The other one is you have the AR functions of all attractions you can provide. After solving the collaboration issue, you can download the specific App patch, I think they are similar to me, but for those who have a limited mobile phone storage space, I would recommend you to have a function of deleting the patch. It is easy to delete the App, so you have to give a function to delete the patch to reduce the file size."

Findings

Findings

Based on the former discussion, the findings of the whole research project can be put forward.

Queensland Government and Associations

The government and associations hold a positive idea regarding AR technology implementation in the tourism industry. However, the Queensland Government doesn't provide specific programs on AR. Instead, it approaches AR development mainly by supporting SMEs who design and provide AR applications to their client.

Queensland Tourism Industry

The tourism industry starts to implement AR to deliver tourism experience. However, the current AR applications onsite are mainly from the government fund bodies or other enterprises with sufficient fund. The SMEs are less involved in utilizing AR Apps to facilitate tourism experiences. Also, AR Apps are used in limited ways and lack of consistency.

AR Application Concerns from Chinese Millennials Perspective

● Awareness and Acceptance of AR Technology

Based on the content analysis of the focus groups and the interview, many Chinese millennials are unconsciously using AR, which means they are less aware of AR technology and AR applications being used in their life. Most of the participants know little about AR technology and AR application at the beginning. After elaborating the concept and offering the example, they realize they have tried AR provided by different industries. Though few of them tried tourism AR Apps in China before, the participants expressed a certain acceptance and positive attitudes towards AR Apps provided to the visitors to facilitate onsite experience. What they expect most is the usefulness of AR and the benefits AR can bring to its users.

Findings

AR Application Concern from Chinese Millennials Perspective

● State Image and the Conflict with AR Apps

The Great Barrier Reef is considered as the icon of QLD. Other than that, most of the participants' image of QLD is nature-based tourism. The hot weather and holiday and leisure purpose are also covered as images.

The road trip is also mentioned as an image of travelling around QLD, which means the visitors expect to visit several beautiful spots along the way and enjoy the view at the same time. The image of adventure and AR App may conflict with the tourist destinations or attractions. However, it still depends on the nature of the attraction as well as how the AR App is utilized.

● On-site Travel Experience

Interpretation is considered as the most important factor that influences visitor onsite experience, which includes the stories told and navigation.

Storytelling is a useful function of AR App to provide more detailed information to those tourists who have specific needs. The superimposed information can make the self-educational process much easier than before.

People agrees that navigation might be necessary for specific target market. For way-finding, the App using arrows to direct people to the place will be better. Also, using animation characters or inviting celebrities to deliver AR experience on navigation will not only better marketing the AR App, but also introduce a better experience in terms of guiding the way.

At the same time, tourists also pursue an innovative and interactive way to get the information when using the AR App. They are not satisfied with an app which only provides navigation and basic information around when on their way but prefer more creative and interactive communication, like using AR Apps more flexibly or hearing a story of this site in a vivid way. It may require a further technology development and combination.

● Opportunity of AR Apps

In general, Chinese tourists perceive that AR mainly undertakes an auxiliary function, which means it may not be the pull factor that attract the visitors to the destination. However, it also depends on how the AR App is used and the nature of the attraction.

Findings

AR Application Concern from Chinese Millennials Perspective

● **Major Influential Factors on AR App Experience**

(1) Roaming data and Wi-Fi: Some tourists who travel overseas do not like to purchase data package or local phone card as the data packages are expensive. Thus, they may not have data or enough data to download the App at the tourist site.

(2) Multiple-language function: Tourists who are non-English speakers, for example Chinese, may not be able to use the AR App if the App only has the English version.

(3) Design: The App should be user-friendly and designed in high aesthetic quality.

(4) Reception: Sometimes, especially at rural tourist destinations, the Wi-Fi or 4G signal may be generally weak or provide no signal at all on a mountain. Tourists may not be able to scan the code and use AR App on-site. If AR Apps are applied to these areas, the tourist industry must consider how to ensure the signal in the rural area.

(5) Content: The visitors expect something unique, interesting and authentic that can capture their attention.

(6) App Store region: If the AR App is only available in Australia App store, tourists are not able to download it and reduces the App usability.

(7) Size: The App file size may set the limitation on the storage space of the mobile phone.
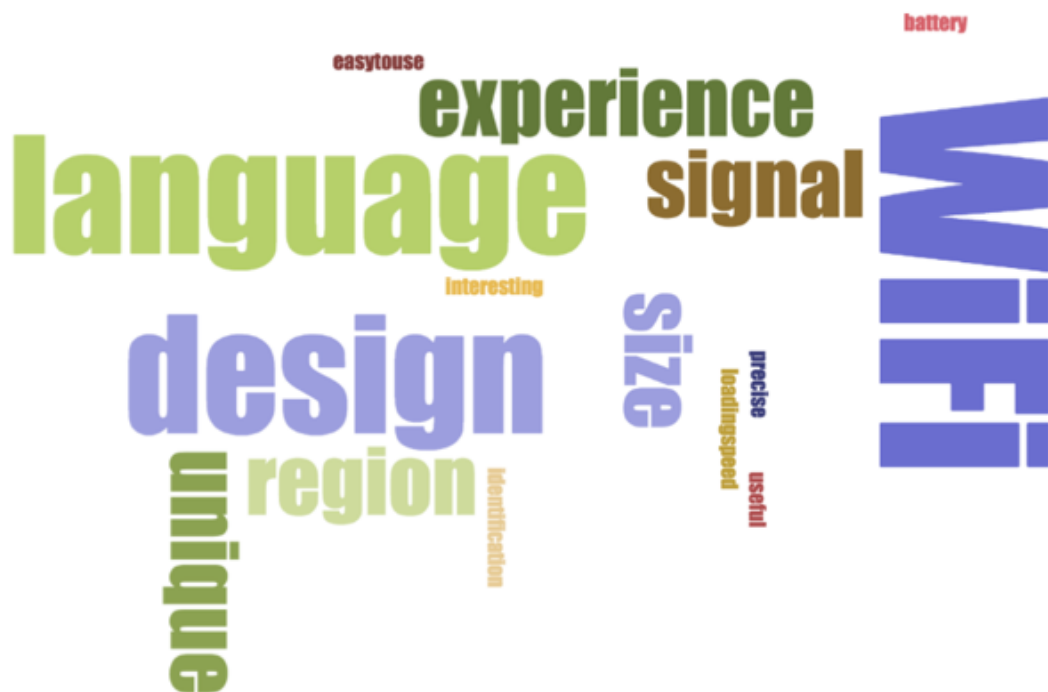
Findings

AR Application concern from Chinese Millennials perspective

● Potential Issues or Debates Remained

Ignorance of the App

The tourists might enjoy their time and scenery so that they potentially ignore the existence of an AR App. The tourist site may consider setting up visible signage to remind tourists the existence of the AR App and encourage them to use it on site.

AR technology and Tour Guide

In terms of whether onsite AR App may replace the job of tour guide, the focus group participants and the interviewees all came to an agreement that the App and tour guide provide different experience and they will not replace each other. Some people think that the App might have influences on tour guide in terms of providing information. However, the tour guides can highly interact with tourists and deliver an experience which cannot be achieved by AR App. The feeling of talking to a real person and to a machine at a tourist destination is entirely different. Also, the special visitor groups such as the senior and the disabled people may not be well served by AR App.

Another concern is that, technology is constantly developing, and AR can also be seen as a part of Artificial Intelligence (AI) from a particular perspective. If it is becoming closely linked with AR or the idea of Mixed Reality is introduced, this question may need a re-discussion.

Findings

AR Application concern from Chinese Millennials perspective

● Interoperability

Interoperability is considered as one of the mostly mentioned suggestion. The Chinese tourists think that keeping downloading new Apps for different attractions is time-consuming. Also, it will bring difficulties for the users to manage different Apps, which may result in lower satisfaction. An all-in-one App will be appreciated if applicable. It is better for the QLD tourism industry to integrate the tourism resource together, so visitors download only one AR App to facilitate the experience in many attractions. This would be much more convenient for tourist to manage their AR App and improve their experience meanwhile.

● Different Apps for Different Target Markets

Some people suggest that different Apps should be built for different target markets as they may have their own unique needs. For example, the App built for the children should include more animation, characters with less and easy-to-understand content.

● Safety Concerns

Safety concern remains a big issue for AR App. It includes both physical safety and digital safety, which refers to privacy issue. The former idea relates to the condition of the user paying too much attention to the screen, failing to notice the environment around him and in turn leads to the physical safety issue. The latter idea concerns the users as the navigation function of the AR App may need to record the route of the users, which they may think it is a violation of their privacy.

Recommendations

Recommendations

Based on the overall findings, the recommendations are provide as further implications.

To Government:

1. Increase the Awareness of AR Apps

As discussed in the former part, AR is a valuable technology that can be applied to enhance the visitors' onsite experience. The government may be aware of the great potential in AR technology application.

1.1 Cooperating with Internal and External Stakeholders

Internal Stakeholders

To provide a neat and highly functional AR App for enhancing tourists' experience, collaborations with different sectors in QLD are needed. As tourists may request an integrated platform for travelling, hotels, restaurants and scenic spots, even the event organizations could work together and figure out an accessible way to implement AR on their own business. It may also request the collaboration between the tourism industry and the government to come out with a plan for AR application on tourism in 3-5 years. Based on the findings, the Queensland Government can provide funding programs to support a project related to AR. The Queensland Government can also provide policy support to tourism operators related to AR. The research and development programs can also be built cooperating with private firms, municipalities and universities.

External Stakeholders

In order to target the Chinese market, government could consider collaborating with some Chinese stakeholders. Diverse ways can be used to enhance the target tourists' awareness of the AR App, such as cooperating with the online travel agencies (OTAs), travel agencies and local communities. For example, *Ctrip*, *Qunar* and *Fliggy* (tourism business branch of Taobao) are well known OTAs in China, so the Queensland Government may try to find the opportunities to collaborate with these agencies. The government could also consider collaborating with social media and differentiating its content from other AR products. The potential partners could be *Sina Weibo*, *WeChat* and *Mafengwo* (a popular online platform for sharing tourism experience) to further help the AR App awareness in potential Chinese tourists.

Recommendations

1.2 Conduct Focused Marketing Campaign for Chinese

At the same time, the government may need to think about how to approach the Chinese visitors when including AR in a marketing campaign. For example, the government can leverage public relations to increase the awareness of QLD tourist destination in China. Government can invite image ambassador whose famous actors in China. They can encourage visitors to travel to Australia and visit QLD specifically. In addition, the Queensland Government can develop advertising campaign through online platform in China, such as through social media and online website. The advertising content can focus on displaying a beautiful scenery of Queensland with beach, sea, and other nature environment. Moreover, some AR applications can be shown in the advertising clip to further attract the Chinese to visit. This could provide a more straight forward idea to the potential Chinese visitor than simply using the word AR.

2. Provide Technical Support

When building up the AR App for the attractions, the government could facilitate the tourism operators to deliver a better AR App experience. The factors may include the free Wi-Fi and strong reception on-site. At remote natural attractions, the signal probably will be worse than urban area. The government could try to strengthen the collaboration with the mobile operators to provide better receptions to support a good travel experience.

Recommendations

3. Platform Building and Training

As a mediator between companies and tourists, the Queensland Government may want to figure out a proper way to bridge the gap between the technology companies and the tourism operations. For example, a communication platform or several webinars can be launched for networking, which provide opportunities for bringing the technical specialists and the industry leaders together. Besides, cultivating relevant experts to adapt the trend of AR development could also be considered. Educational programs could be launched to train them with advanced AR technology.

Recommendations

To QLD Tourism Operators:

1. Pay attention to AR App Functions

1.1 Go through the Influential Factors

Based on the findings from the focus groups and interviews, the influential factors on delivering AR App experience are identified. These factors have significant influence on visitors' willingness to use the App. To deliver a better service to enhance visitor experience, the enterprises could carefully evaluate whether the factors are treated well. As different attractions have different characteristics and nature, it's hard to set a standardized criteria. However, some of the recommendations in general can be put forward, such as designing multiple-language App version and launching the App in App Store in China.

1.2 Make the Application User-friendly

Visitors prefer to experience the fanciest experience with the least effort of learning. When thinking of applying AR to the destination, the tourism operators may try to keep things simple, easy to understand, and cost the user less effort to make the App work.

Also, using attractive ways to draw the tourists' attention to use the App is the core of design philosophy. Combining games and navigation functions with QLD natural scenery may be attractive to the young generation. Providing different ways for interaction between virtual information and real objects can reinforce their feeling towards the tourist destinations.
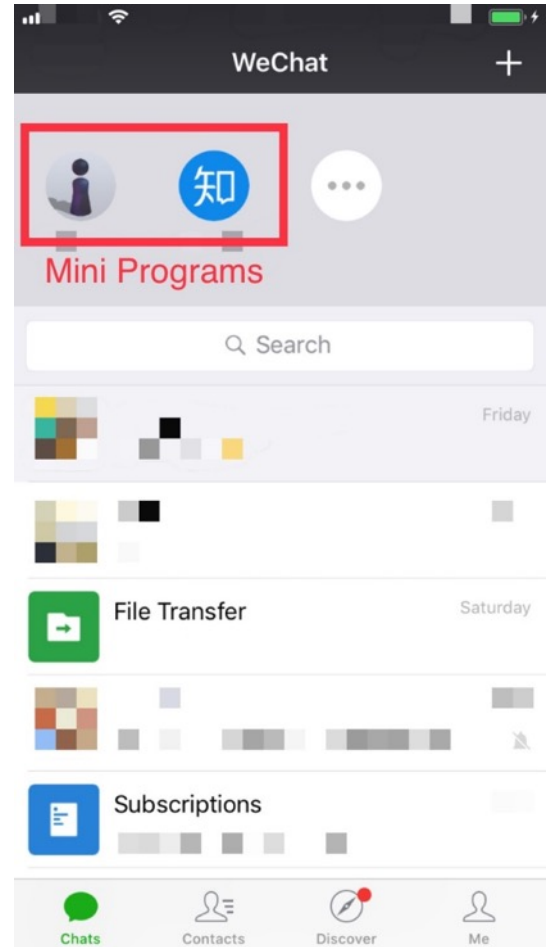
Recommendations

For those enterprises who do not have efficient funds on developing AR Apps, another approach can be developing AR in Mini Program based on WeChat. As WeChat is one of the biggest social media platform in China which has been widely used, visitors do not need to download any App but experience AR directly in WeChat.

Mini Program is a kind of in-App application that is recently introduced by WeChat. Nowadays, Mini program is becoming one of the most popular application in WeChat, especially in Chinese millennials, for its convenience.

More importantly, Mini program does not require any data to download. It means that users just need to search the name of program in WeChat or use the function called Mini Programs Nearby, then they are able to use the application immediately. It is time-saving for visitors. Besides, Chinese Apple Store account prevent visitors from downloading Apps only available in Australia App Store, which means some Apps developed by foreign countries can't be seen or used by the Chinese. Hence, though the experience might be a little bit limited compared to a separated App, developing AR Apps as Mini Program may also be a choice for some of the tourism operators.

Recommendations

1.3 Consider Safety Issue

To ensure security, it is necessary for App designers to provide clear notification or guidance when designing AR App to minimize the potential issue. For physical safety issue, people often fall or bang into others while walking and using any electronic devices. Hence, if visitors get too close to cliffs or rivers, the AR App can send some notifications such as "look up", "be aware of the surroundings", "time to look up", etc., in order to alarm the potential dangers to visitors. For the information safety and privacy issue, the App could provide explicit notifications to the users to inform them about the usage of their information, which could help the App user to better manage their privacy.

2. Improve the Quality of Content

AR and other new technologies are only tools to make more possibilities for visiting destinations. These tools are important, however, the content is more important in delivering experience for visitors and this is what visitors want. Therefore, content could be designed based on customer's needs, whether for storytelling, for wayfinding or increasing interactions.

To provide a high-quality content, the tourism operators could identify their strengths and the uniqueness of their experience by conducting marketing research to stay current and updated with the trends in the market. They could also continuously deliver the high-quality content which is unique, interesting, authentic, and cannot be found from elsewhere.

Also, the tourism operator could have a clear idea on their target market and start to consider the chances left in providing different Apps to different market based on their specific needs. For example, the AR App designed for children could be simpler than for the adults. The characters can also be introduced to raise their interest. The designer could also consider the aesthetic aspect if the operator identifies Chinese as one of their target market, as they may have different perceptions because of different cultural background.

Recommendations

3. All-in-One App

The QLD tourism operator could try to facilitate the tourism industry to design and develop a concentrated AR App which includes a wide range of AR Apps in QLD. A concentrated App for a tourism destination means containing multiple tourism destinations' information in one App or linking different Apps together rather than independent Apps for single destination's information. To grasp this goal, different patterns can be tried out such as adding patches in one App to bring Apps together or building an integrated platform with adequate information to let the users choose and download freely. It brings convenience for tourists to download the App once and use for multiple places during their travel.

Though it is acknowledged that this recommendation is very hard to achieve as the government need play its mediator role and it also requires the close collaboration between the industry, it could benefit the stakeholders.

THE ALL-IN-ONE APP TREND

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Appendices

Appendices

Appendix 1. Demographic and Geographic Information of Focus Group Participants

	Attendee 1	Attendee 2	Attendee 3	Attendee 4	Attendee 5	Attendee 6
Age	24	25	25	26	23	25
Job	Student	Student	Student	Student	Student	Student
Education level	Master Degree	Master Degree	Master Degree	Master Degree	Master Degree	Master Degree
Major	THE*	Chemical engineering	THE	THE	THE	THE

*THE: Tourism, Hotel and Event Management

Table1. Demographic Details of Focus Group 1

	Attendee 7	Attendee 8	Attendee 9	Attendee 10	Attendee 11	Attendee 12
Age	24	23	21	24	24	28
Job	Student	Student	Student	Student	Student	Student
Education level	Master Degree	Master Degree	Bachelor Degree	Master Degree	Master Degree	Master Degree
Major	THE	THE	THE	International Economics & Finance	Economics & Finance	THE

*THE: Tourism, Hotel and Event Management
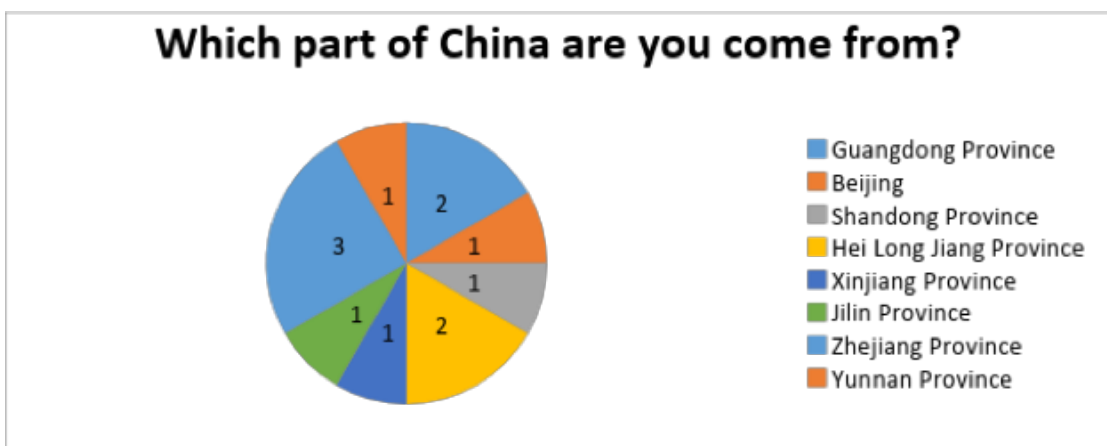
Table2. Demographic Details of Focus Group 2

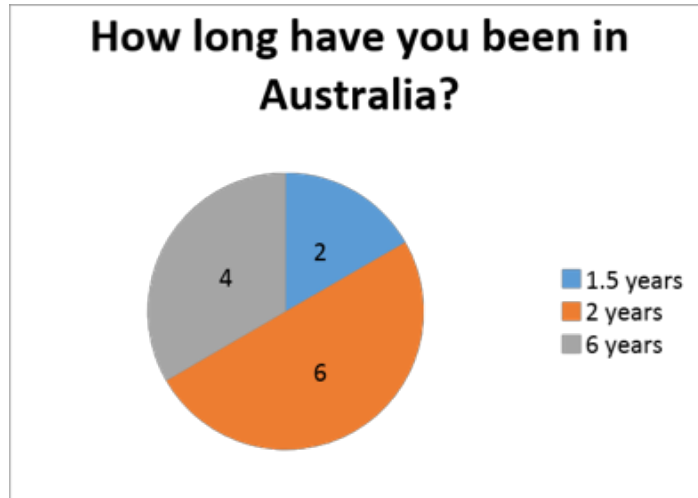Figure1. Geographic Detail of the Focus Groups 1

Appendices

Figure2. Geographic Details of the Focus Groups 2

Appendix 2. Demographic and Geographic Information of the Interviewees

		Interviewee 1	Interviewee 2
Demographic	Age	33	23
	Job	Student	Student
	Education Level	PhD Student	Master Candidate
	Major	Geophysics	Geo-information Science & Earth Observation
Geographic	Which province/city are you come from?	Hebei Province	Sichuan Province
	How long have you been in Australia?	2 months	Never (Currently study abroad but not in AU)