

[서식3] 디자인 씽킹 & 국제교류
Design Thinking & International Exchange

주제	The challenge newcomers face in navigating the school campus					
팀 정보 ※ 팀원 모두를 등록하세 요		이 름	남 여,	소속 학교	학년	역 할
	팀장	Hyoyeon Lee	남 여,	Branksome Hall Asia	11	Team leadership and setting work focus
	팀원1	Mina Sung	남 여,	Branksome Hall Asia	11	Idea proposal and participation in execution
	팀원2	Junghyun An	남 여,	Branksome Hall Asia	11	Strengthening teamwork and conflict resolution
	팀원3	Stacie Ziheng Chu	남 여,	Branksome Hall Asia	11	Organizing team's opinion and giving feedback
지도교사 ※ 교사, 학부모 등	이 름	Seunghwa Shin (신승화)		연락처	010-8383-7655 / wintersi@yahoo.com	
1. 문제 발견 및 주제 선정	1)학교내 어떤 문제를 선택했나요? 2)주제를 선택한 이유? 3)문제의 심각성과 영향을 어떻게 판단? As students of Branksome Hall Asia, we see ourselves not just as learners but as changemakers. We believe it's our responsibility to shape a better school environment for future generations: we observe and we change. Thus, the first step to change is to discover problems and select topics. To do so, we created a mind map where we came up with the problem idea (Figure 1). We began by identifying which issues at our school felt most personally significant, particularly those that caused us stress and discomfort. After realigning our focus, we reflected on our own experiences as new students. We remembered how difficult it was to adapt to a new school environment and how intimidating it felt to ask for help. Finally, we chose the most prevalent problem occurring within our school: many newcomers at our school, including students, parents, and faculty members, struggle to find their way around the campus. Our school has a large campus layout with various facilities that are spread out across multiple floors and different buildings. This can be confusing for those who first came to this school, for example, during the first few weeks, it is common to see students wandering around, asking others for directions, or arriving late to classes. Furthermore, as our school is an international school, it represents students and faculty from various backgrounds. In the case of the students, every year, we face a significant number of new students joining across different grade levels, many of whom are unfamiliar with the environment. While we have printed school maps and faculty members willing to help, these existing solutions aren't always accessible at every moment. These ramified problems ultimately came up to us to put our focus on, so that we can promote newcomers' confidence to navigate the school campus. We judged the severity of this problem based on how often it happens within our school. Every first few weeks of the semester, we consistently witness new students looking lost, such as wandering around the hallways and hesitating to go inside the classroom. This has made it clear that the issue that we are seeing now is not minor nor can it be simply moved along, but something that affects a large number of people in the community.					

2. 공감단계 Empathize	1)문제를 겪는 사람은? 2)어떤방식으로 공감? (인터뷰, 설문, 관찰등) 3)주요내용은 무엇인가? The targeted audience will be newcomers to the school, including new students, exchange students, new faculty members, and parents. To emphasize, a survey will be conducted targeting new students and their parents to understand their feelings and experiences during the confusion of navigating the campus. The survey has been selected as the most suitable method because it enables us to quickly collect direct statistical data from the participants. Furthermore, the questions are designed to allow respondents to express their feelings clearly and directly, while benefiting from the anonymity that the format offers. Ultimately, the survey will be both efficient and reliable, which helps us empathize with our audience and thereby develop the most appropriate solution. The survey will begin with the question: “When you were a newcomer, did you ever get lost or feel confused while navigating the campus?” Based on the response to this first question (yes or no), follow-up questions will be presented accordingly. Yes: - Can you specify these feelings with 3 keywords? - What exactly happened when you faced this problem? - Were you able to find a way to get through this struggle? + How did you manage to overcome it? If not, why not? No: - Have you noticed other newcomers experiencing this problem (struggling to navigate the campus)?
3. 정의단계 Define	1)공감을 바탕으로 핵심문제를 어떻게 정의했나요? (000는 000때문에 000하는데 어려움을 겪고있다) 2)이 문제를 해결해야 하는 이유는 무엇인가? Newcomers, including new students, exchange students, new faculty members, and parents, face difficulty in navigating the massive campus and finding specific classrooms or facilities because they are unfamiliar with the campus layout. According to the survey, more than 68% of respondents felt lost and confused while navigating the campus on the first day (Figure 2). Even among the remaining 32%, some noticed other newcomers struggling to find their way. This shows that a majority of students experience difficulty navigating the school environment. Respondents who experienced the problem reported that they felt negative emotions such as “panic”, “nervousness”, “anxiety”, and etc. Each of them had different experiences getting lost, with one of the respondents mentioning that “[they] didn’t know how to get to the gym on the first day of school.” This shows that the issue of navigating the campus is widespread at the school. Additionally, while some noted that they overcame the problem by asking people around them or by reading the campus map, others mentioned that they couldn’t find a way to get help when they felt lost or confused. They said that they felt pressured or hesitant to ask other students or faculty for help, had no one nearby to ask, or had difficulty reading the map. Moreover, the issue of newcomers feeling lost or confused on campus should be addressed to make our school more inclusive. Newcomers will then be able to navigate the school more easily and feel respected, valued, and supported. This is especially important because our school is an international school, where a sense of belonging and connection is crucial. However, when newcomers feel welcomed and supported, they are less anxious and are more likely to engage confidently and form strong connections at the school.

4. 아이디어 도출 Ideate	1)해결 아이디어를 어떻게 도출했나요 (브레인스토밍 마인드맵등 사용한 방법) 2)팀원들의 다양한 아이디어를 어떻게 정리하고 비교했나요? 3)최종 해결 아이디어를 선택한 이유는 무엇인가요? To make effective decisions, we engaged in thoughtful debates and used tools like comparison tables to evaluate the strengths and weaknesses of each idea. By doing so, we came up with the idea of creating a system that helps newcomers feel welcomed and oriented. When considering how to solve the problem, we all agreed that it should involve technology, as we wanted to give new students technological options rather than pressure them to seek help. Technology seemed like the best solution because it is convenient, accessible, and doesn't require direct communication. Therefore, using technology appeared to be the fastest and most efficient way to address the problem. However, we recognized that there are various technological approaches—such as AR, AI, and VR—so to
--	--

refine our ideas, we created a pros and cons table. This allowed each team member to propose a tech-based solution and evaluate it. By doing so, we were able to decide on the idea that has the greatest potential to help newcomers navigate the school effectively.

Table 1: Evaluation of Technological Approaches

Name	Solutions	Benefits	Limitations
Mina Sung	VR	- Provide immersive experiences, where students can feel entertained while being guided.	- Can't be used in practical applications, as users have to wear glasses and stay in place
Hyoyeon Lee	AR	- Combines virtual elements with reality, offering an immersive experience. - Simple and easily accessible, as only a phone is needed for guidance.	- Relies on sensors and cameras, so it may be hard for students to detect in overly dim environments, such as our school gym, located on the top floor of the building.
Junghyun An	AI	- AI can provide multiple routes to the same destination, including shortcuts. - Unlike GPS, which can't distinguish between specific locations within the school, AI can be trained by machine learning with input data consisting of images of specific areas to recognize the specific location.	- Requires high-quality data in large quantities to produce good results, which can be technically challenging.
Ziheng Stacie Chu	QR Code	Noting the abundance of tech-based ideas, I focused more on implementation, asking myself questions like "How will students interact with the system?" Using QR codes around the school seems to be the best solution, as it is convenient and simple—requiring only a quick scan to access the service.	- Hard to maintain frequently as it is intact, for the posters, as they can be easily damaged, moved, or vandalized due to its location and exposure to the outside conditions and weather, hence it requires regular upkeep.

About technology, we found the ideas involving VR, AR, and AI to be the most relevant. We first eliminated the use of VR. The biggest issue was its impracticality; students using the application to find their way around school cannot stay in a fixed position, which VR often requires. Even if we showed them a VR simulation beforehand, it would still be difficult to remember each route, as VR acts more like an animation rather than offering real-time assistance. Moreover, VR's main advantage, providing an immersive experience, was not compelling, since AR can achieve the same outcome with more manageable limitations. As a result, VR was the first idea we eliminated. Next, we evaluated the pros and cons of AR. Although AR relies heavily on sensors and may occasionally result in detection issues, this is rarely a problem in our school, where the lights are usually on. Even in less optimal conditions, AR's benefits outweigh its limitations. AR is accessible and user-friendly; by placing posters with QR codes around the school, newcomers can easily access navigation support when needed. This immediacy and integration of virtual elements with the real world can significantly help them remember routes better. Next, we considered AI. While AI requires high-quality data in large quantities for high accuracy, it can provide multiple routes to the same destination, including the most time-efficient short-cuts, and recognize specific locations, which enhances the user experience. Ultimately, we concluded that integrating AI and AR with a QR code-enabled poster offers the most

	practical and effective solution. AI generates multiple routes and identifies the user's location, AR visually guides users with contextual descriptions, and the QR code enhances accessibility.
5. 해결안 구체화 Prototype	1)선정한 아이디어는 무엇인가?(예: 급식 시간대조정시스템, 소음감지 알람장치등) 2)해결안을 구체적으로 어떻게 만들었나요? (모형제작, 시제품개발, 안내물 구성등) Our final product is a program called BHA Navi that incorporates AR and AI to help newcomers who have difficulty finding specific places navigate the school more easily. The program includes various screens, such as a home screen and a route view screen, to provide users with an effective navigation experience. Alongside BHA Navi, a QR code poster will be displayed to help newcomers easily access the service around the campus. The following are brief explanations about the components of the prototype. - Home screen (Figure 3) - <u>Branksome Hall Asia Map & Legends</u>: provides users with an overview of the school's layout to introduce the campus and help them locate their final destination. - <u>Current Location</u>: displays the user's current location within the campus in real-time. - <u>Search Bar</u>: allows users to enter and search for their desired destination. - Route View screen (Figures 4, 5, 6) - <u>Animations</u>: help users picture themselves and others in the space. This also showcases the variety of activities available in each location, enhancing both understanding and engagement. - <u>Directional arrow</u>: guides users from their current location to their destination, which allows intuitive and user-friendly navigation. - <u>Remaining distance</u>: provides the remaining distance to the selected destination to help users better understand how far they need to travel. - <u>Descriptions of each location's purpose and main features</u>: help users become more familiar with the facilities as they navigate the campus. - Poster that displays the QR code that leads to the app download page: the poster contains the message, "Scan this if you're lost. The school AI is here for you to guide you to where you want to go within the campus." (Figure 7) - The phrase is large enough to be easily noticed. - The QR code is appropriately sized to be scanned effortlessly with a smartphone camera from a short distance. We began by prototyping our idea using Canva, which allowed us to create a variety of visual demonstrations that users can experience when interacting with the app. First, we collected campus images from specific locations and a general map of the school to use as reference examples. Next, we identified key features such as a description of the current location, animated characters demonstrating activities, all of which would appear in the specific locations. Before moving on to high-fidelity design, we created low-fidelity wireframes. This allowed us to visualize how the images and features would appear to users and assess their effectiveness. After this, we developed the high-fidelity prototype using Canva. Throughout the design process, we carefully considered visual aspects such as color schemes, shapes, layout, and font choices to ensure the overall design was aesthetically pleasing and user-friendly. For the QR code poster, we created a simple and modern design with an instructional phrase using Canva. We tried to make it as eye-catching as possible by carefully considering the color scheme, shapes, layout, and font choices. After that, we put the service link into the QR code.

6. 토론 및 협업과정	1)역할분담은 어떻게 했나요? 2)의견충돌은 어떻게 해결했나요? 3)의사결정은 어떤 방식으로 했나요? (예, 다수결, 공감토론, 리더결정 등) 4)가장 기억에 남은 토론이나 갈등 해결 사례는? When we divided roles, we typically assigned sections of the report based on what each person wanted to work on. We trusted that the task someone volunteered for first would likely be the one they could handle best. Furthermore, despite the overall report writing, there were other tasks to work on, such as creating evidence in support of the main content. In this case, we assigned them based on each member's strengths in their capabilities. For example, one of the tasks was creating a prototype of our products, involving designing a poster and an app screen. We assigned this to the members with prior experience in art-related projects, as they could produce the most polished results relative to those who have no experience. We made final decisions only when all of our team members reached consensus. This was because we thought decisions made with full agreement are more effective, especially when everyone supports the idea. However, it was difficult for us to narrow down all our different ideas into one, especially when our opinions clashed. Whenever this happened, we tried to give ourselves the time to pause and move on to another section, which allowed us to better understand teammates' ideas that initially didn't make sense, but became clearer later through new contexts in the process. Therefore, this decision-making process helped us build more bonded teamwork by acquiring a better understanding of each other. We resolved conflicts of opinion through group discussions. For example, when our team had two different ideas, we shared our thoughts critically. Each person presented their ideas with detailed explanations and explained why they believed their idea was effective. Other team members then asked essential questions and critically analyzed the limitations of each idea. We repeated this process several times and eventually reached a conclusion about which idea to move forward with by holding a vote. Rather than letting the discussion become emotional, we tried to maintain a logical and objective approach throughout the process. One of the most memorable discussions we had was when we debated whether or not to include QR codes in our product. One teammate first thought QR codes were unnecessary because she believed the focus should be on the AR and the AI technology itself. However, another teammate thought that QR codes should be part of the final product, as the QR codes would determine the distribution of how the app could be reached by the newcomers of the school. As another teammate suggested this idea, the teammate asked where the QR codes would be placed and raised concerns about the posters with QR codes and the need for ongoing maintenance, which is time-consuming. In response to her concerns, another teammate explained that it would be difficult for newcomers to access our service on their own since they were still unfamiliar with the school. They argued that placing QR codes in visible locations around campus would be the most intuitive and effective way to help newcomers access the service and navigate the school more easily.
7. 활동 소감	1)디자인씽킹 활동을 통해 느낀 점은? 2)학교문제를 해결하는 과정에서 배운점은? We felt mind-blowing during the design thinking activity because, foremost, it was an opportunity for us to brainstorm and develop aspects of our school that we unanimously want to improve. What this means is that the design thinking activity allowed each of our teammates to envision our developed school after implementation, and this excited us. Furthermore, the ideas were all based on our interests and strengths, allowing us to express our creativity freely that we couldn't normally do in our schoolwork, which has certain criteria to assess us. For example, some team members have interests and strengths in advanced technology fields such as AR, VR, and AI, while other members possess interests and strengths in the business field. Although these areas differ, we were able to collaborate with one heart and produce a unified outcome. Through the process of solving school problems, we not only gained a closer look at and a deeper understanding of our school and its system, but we also believe that the most critical lessons we learned were collaboration and critical thinking. First, collaboration played a key role. We had many discussions while trying to come up with the best solution, and at times, we disagreed and tried to persuade one another. To ultimately reach a final idea, we had to actively listen, communicate clearly, and make sure everyone was on the same page. Second, we developed strong critical thinking skills. We learned different strategies to break down large problems into smaller, more manageable ones. For example, when we first decided to solve a school issue using technology, the idea was too vague, since technology today serves so many purposes. Thus, by organizing our ideas into tables

and categories, we were able to narrow down our direction and arrive at a clearer, more focused solution. In short, while we gained many skills through this experience, collaboration and critical thinking stood out as the most valuable.

8.

첨부자료
[선택사항]

활동사진, 아이디어스케치, 인터뷰/설문자료등 - 첨부자료로 보내주세요

Figure 1: Mind map created by the group during the brainstorming session to identify a problem.

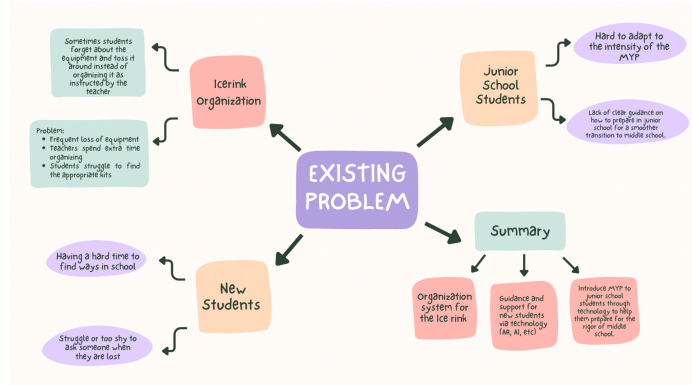


Figure 2: Survey on newcomers' difficulties in navigating the campus

When you were a newcomer, have you ever been lost or felt confused while navigating the campus?

[Copy chart](#)

학교에 처음 왔을 때, 길을 찾을 때 혼란스러웠던 적이 있으신가요?
当您初来乍到时, 您是否曾在校园里迷路或感到困惑?

22 responses

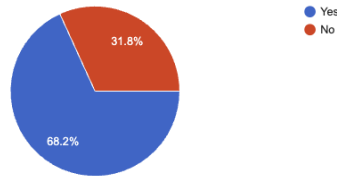


Figure 3: Home screen of BHA navi



Figure 4: Route View screen of BHA Navi – Bridge



Figure 5: Route View screen of BHA Navi – Boy's Pod

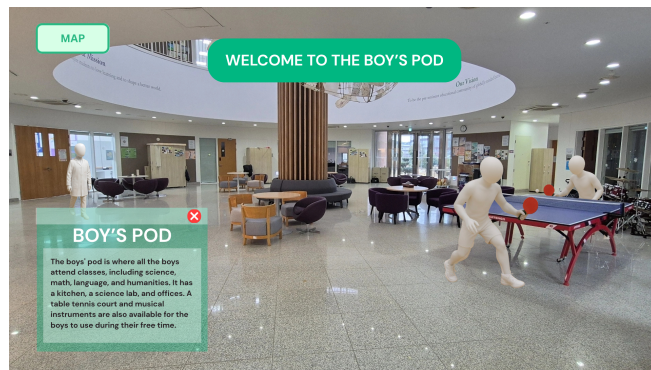
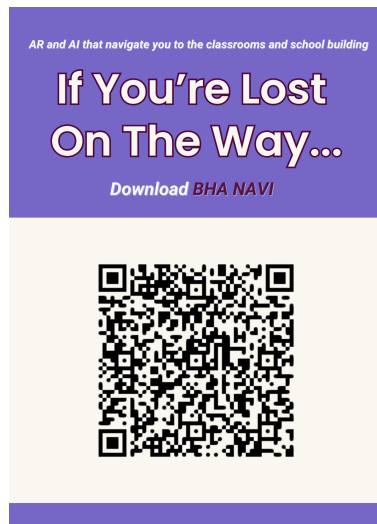


Figure 6: Route View screen of BHA Navi – Gym



Figure 7: QR code poster



Survey Form Responses:

<https://docs.google.com/forms/d/11jhoiYMxVGX8ocqlg7F7eoclf7PFN6f3MnsFRBR4Uvl/edit?ts=687f97cc#responses>