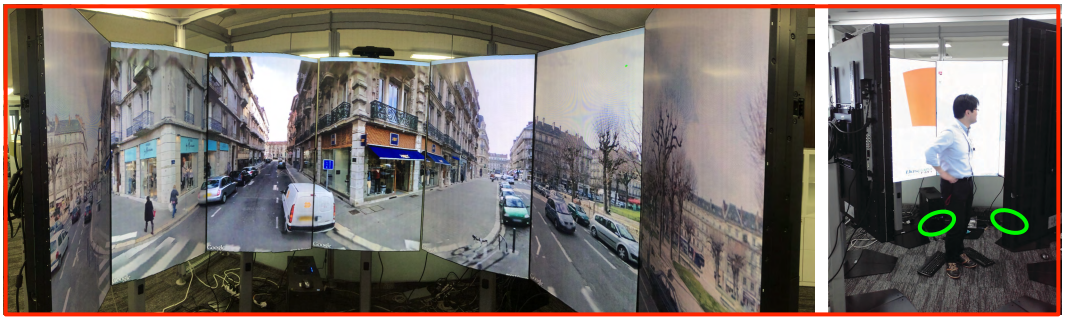
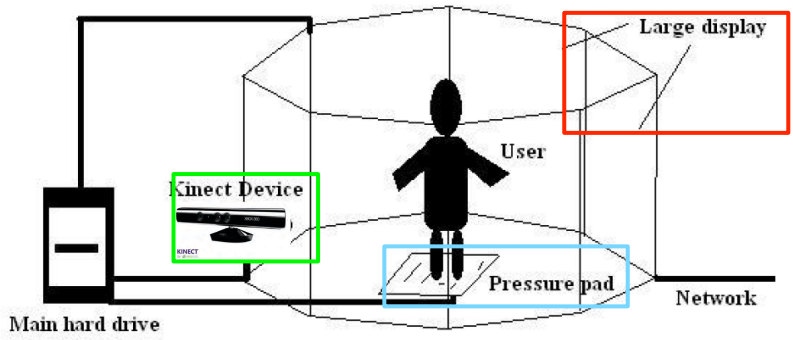
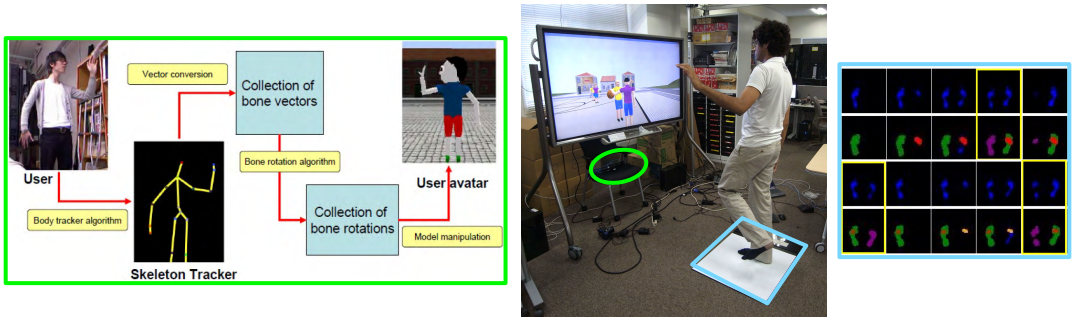
問題発見型／解決型学習(FBL/PBL) テーマ提案（学生募集内容）

Topic name	Foreign Language Education++ 2
Teachers	Design Unit Specific Assistant Professor NITSCHKE, CHRISTIAN Design Unit Specific Associate Professor MURAMAKI, YOHEI
Collaborators	
Topic background	With ongoing globalization, English language skills become more and more important. While Japan is a leading economy and global exporter, Japanese professionals are known for surprisingly low English ability even though at least five years of compulsory study. A more detailed investigation reveals that Japanese are not poor in English per se, but rather lack real-time oral communication skills. The preceding spring-term PBL「Foreign Language Education++」(*) identified several major reasons, including cultural context, personal motivation and educational method. The common practice in foreign language education (especially in Japan) follows the word-paired associate learning paradigm, memorizing associations between linguistic expressions and translations. However, as the philosopher Wittgenstein suggests, the meaning of language is defined by its use. Regarding the foreign language learning environment, it implies that the learner instead needs to learn a language as an association between the linguistic expressions and the situations in which they are used. A survey in cognitive psychology further revealed that the paradigm of situation-based learning (SBL) is very similar to the way infants acquire their mothers language, and may be also effective for acquiring a foreign language. We designed the “English Karuta” game concept as an instance of this paradigm, fulfilling the design requirements of easy understanding, supporting different levels of difficulty, sustaining motivation and enabling communication. An evaluation showed that a preliminary implementation with a simple collection of printed photos is not effective, as it does not convince as a learning tool and requires non-feasible preparation efforts from the teacher. Nevertheless, the concept itself is identified as promising and fulfilling all design requirements, if realized with an automated technology-based approach, covering learner and level adaption, content generation, immersive and interactive environment, and remote teachers/students and intelligent agents. Along with the requirement for a technical realization of an SBL concept, we experience a rapid development in computing technology, where key factors are increasing power at decreasing scale; increasing I/O capabilities through multimodal non-intrusive sensors and actuators; and increasing number and diversity of devices. This leads to a paradigm change towards ubiquitous computing, ambient intelligence and immersive environments. With the VR (virtual reality) booth at KRP we have an ideal environment to study, design and experiment with new technology and interaction concepts to create an immersive simulated reality (Figure 1). Its key features are a 360° display, multiple Kinect cameras to capture human body pose and 3D model, a pressure-sensitive foot-mat to recognize walking and turning motions, a faceLAB system to capture face and eye movements, and a Polymate system to measure various physiological signals. Similar setups at Yoshida campus allow for remote multi-user and tele-presence scenarios. (Please visit the Youtube-channel of Nishida

	Laboratory for demonstrations: https://www.youtube.com/user/KyotoUniNishidaLab).    **Figure 1**: Virtual Interactive Spatially Immersive Environment (VISIE) with 360° panoramic display, Kinect body motion capturing, and pressure pad walk detection, to control a virtual avatar. (*)Resources from 2014 Spring-term PBL「Foreign Language Education++」 Proposal: http://www.design.kyoto-u.ac.jp/pdf/fbl_pbl/fbl_pbl2014/nitschke20140304r1.pdf Introduction (PDF, 8 MB): https://www.dropbox.com/s/v5o29p56nwtkqzu/20140527%20PBL%20Introduction.pdf?dl=0 Mid-term presentation (PDF, 3 MB): https://www.dropbox.com/s/j8larkdvqv1rcy1/Intermediate_presentation_outline_final.pdf?dl=0 Final presentation (PDF, 24 MB): https://www.dropbox.com/s/tlk3shammajpa6t/FINAL_PRESENTATION.pdf?dl=0 Final report (PDF, 4 MB): https://www.dropbox.com/s/fphplfhgzp5udur/report.pdf?dl=0
Overview	In this PBL, we want to continue the necessary efforts to address the problem of foreign language and culture education, connecting to and building on the foundations of the previous PBL. We will focus on designing an education approach and method for the development of English oral communication skills in Japan. Our solution should be technical, inspired by the potential and challenges of technological progress. Specifically, we want to analyze if and how

	immersive environments can be of a merit. For example, to connect people at remote locations, to create situation contexts, to provide planning and quality measurement, and to increase motivation. We follow a more structured approach to analyzing the current situation and potential, comprising identification of problems, potential assessment for situation-based learning, and design of a solution concept. Starting from the concept of "English Karuta", we may go into very different directions, for example: • designing and realizing a prototype of a technical Karuta system (that may also become rather different from the original idea); • designing a comprehensive Karuta system infrastructure considering technology, teaching scenarios, business models, impact on society, official policy, and others; • conducting sophisticated experimental evaluation considering control condition, meaningful scenarios, and relevant questions; and • completely revoking the concept of Karuta and proposing a novel idea. The PBL will cover the following four phases: 1. Introduction (1-2): After a general motivation of the topic, we provide an overview to the topic, previous problem definition, discoveries and outcomes. In order to design something new, it is important to understand the potential and challenges of available resources. Therefore, we will explain the concepts behind immersive and interactive technology in mini-lectures and demonstrations. 2. Investigation (3-6): A major issue of the previous PBL was that the work mainly grounded on personal experience and intuition. To account for this, we want to take a structured approach to develop a foundation, comprising an interview of a native English teacher or an expert in foreign language education and seminar presentations on fundamental topics related to everyones expertise and interest. 3. Problem definition and solution approach (7-8): Building on the foundations, expectations, and outcomes of individual and group work, we will develop a problem setting and solution approach. The premises are that the problem is relevant, and the solution is feasible and integrates the contribution of all participants to achieve different aspects of a common solution. 4. Solution design and implementation (9-14): After intermediate presentation, we will work out the realization plan and implement the solution. The scope may reach from a theoretical study, over the implementation of a prototype, to the realization of experiments. As this is the most important part of the course, we increase the time resources compared to the previous course.
Place	KRP Building #9, Room 506, Flexible Space / Virtual Reality System Booth

Conditions for participation	Nothing in particular. Remarks: 1. Background and skills The aim of this PBL to solve a “real-world” problem in education and identify questions and design solutions related to technology. The focus lies on problem solving in an interdisciplinary environment. 2. English ability The course will be held in English. However, interested participants are especially encouraged to not reject this course because of English skills. The level and usage of English will be flexibly adjusted based on the level of the participants, and will not count for grading the course. The aim is to create a comfortable atmosphere for the use of English, to enable the access of globally available resources.
Number of participants	Min: 3 Max: 8
Application deadline	October 10 (Friday)
Target participants	Anyone motivated and interested in the topic, especially • undergraduate, graduate students, members of Kyoto University; • undergraduate, graduate students, members of universities and institutes; • engineers, researchers, general members of companies. However, if the number of applicants exceeds the maximum, priority will be given to Design School students.
How to apply	By email, including the following: To: christian.nitschke@i.kyoto-u.ac.jp CC: fblpbl-application@design.kyoto-u.ac.jp Subject: [FBL/PBL 参加申込] Foreign Language Education++ Mail body text: name, organization, position/school year, email address, web page, background knowledge and field of specialization, course topic name, motivation for course application, and other information
Decision of participants	By email, until October 17 (Friday)
Design theories and techniques for problem analysis and solution finding	Hard skills: • Understanding potential, limitations and usage of computation technology • Design, implementation and evaluation of complex hardware systems • Prototype implementation Soft skills: • Brainstorming • Presentation and discussion • Interdisciplinary collaboration • English language and inter-cultural ability (see “Conditions for participation”)
Method for studying theories and techniques	The course will comprise: • Mini-lectures on technologies, Mixed and Virtual Reality (MR/VR) design • Survey, seminar presentation and discussion • Design and implementation of a prototype or a subproblem

	• Combined final report The participants will work together and contribute different aspects of a common project.
Method for publishing the results	We will create and maintain a cloud storage shared folder that contains all materials (presentation slides, discussion notes, source code, demo material, documentation, photos, etc.) that provide an overview of the course, problems and solution methods, study progress and results.
Performance evaluation method	• Class activity, intermediate/final presentation, final report: 50% (observation and material) • Comprehension of topic, theories and methods: 30% (observation and material) • Quality of problem finding and solution design: 15% (observation and material) Attendance requirement: 100% of class time. For missed classes, you need to get information about the class content from TA and other members, and compensate the work through a document uploaded to the shared folder.
Special remarks	Project outcome: • To ensure the preservation of the knowledge and continuity of the course, participants will upload all materials to a cloud storage shared folder that we extensively use in the course. • All participants together as a team will create a combined final report that summarizes the course, including solved problems, progress and results. Every participant contributes ~3 pages written text (partly general, partly specific topic), with unlimited space for pictures, figures, tables and references. • We offer the option to guide and financially support the participants, who wish to further shape the results into an academic publication at an international conference. We encourage such effort, because academic work and publishing is important to the graduate program and doctors course study.

実施計画

(The class schedule will be decided based on the participant availability before the first meeting.)

Unit	Schedule	Place	Content
1	End October	KRP	Introduction lecture • Motivation and aim of the project • Outline and organization of the course
2			Technology mini-lectures, tutorials • Demonstration of virtual reality system at KRP • Multi-display visualization, interactive (game) programming • Kinect, pressure-pad, faceLAB, Polymate sensors for non-intrusive interaction and data acquisition
3-4	Begin. November		Interview and discussion with native English teacher / expert • Problems in English education, skills, future needs, etc. • Best practices, ideas for improvement, etc.
5-6	Mid November		Seminar presentations and discussion of self-chosen topics, relating • own field and interest with • general information, problem analysis, solution ideas, etc.
7-8	End November		Definition of problem and solution approach • Idea proposal, brainstorming, discussion, negotiation • Intermediate presentation preparation

	Begin. December		Intermediate presentation
9-10	Mid December		Solution design • Propose solution concept as a team with individual aspects • Plan of when, who will do what until final presentation
11-12	Begin. January		Solution implementation 1 • Differs based on the scope of contribution (survey, study, mock-up, prototype, experiment, media, etc.)
13-14	Mid January		Solution implementation 2 • Differs based on the scope of contribution • Creation of documentation material (videos, screenshots, usage documentation, etc.)
15	End January	Yoshida Fab	Final presentation
	Begin. February		Final report, material consolidation

※KRP: デザインイノベーション拠点（京都リサーチパーク 9 号館 5 階）