

Team 2

**SKKU**EM

Online RTS Exam Manager



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# Overview



## Overview Background



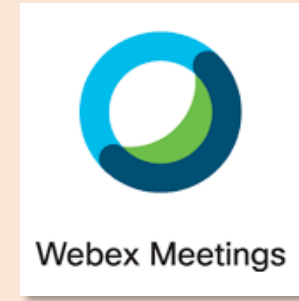
Due to the Covid-19 Situation, Schools and Universities (including SKKU) open online classes.

**Then, how is the exam going?**

1

Overview

## Currently using platforms



### LearningX/Canvas/iCampus

For taking exams

### Video conferencing apps

For Supervision - Ex) Webex

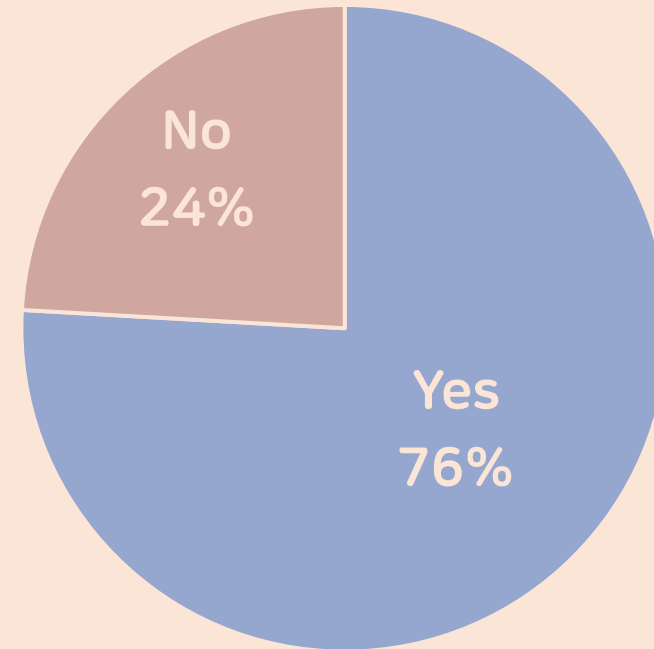


Overview

## Market research

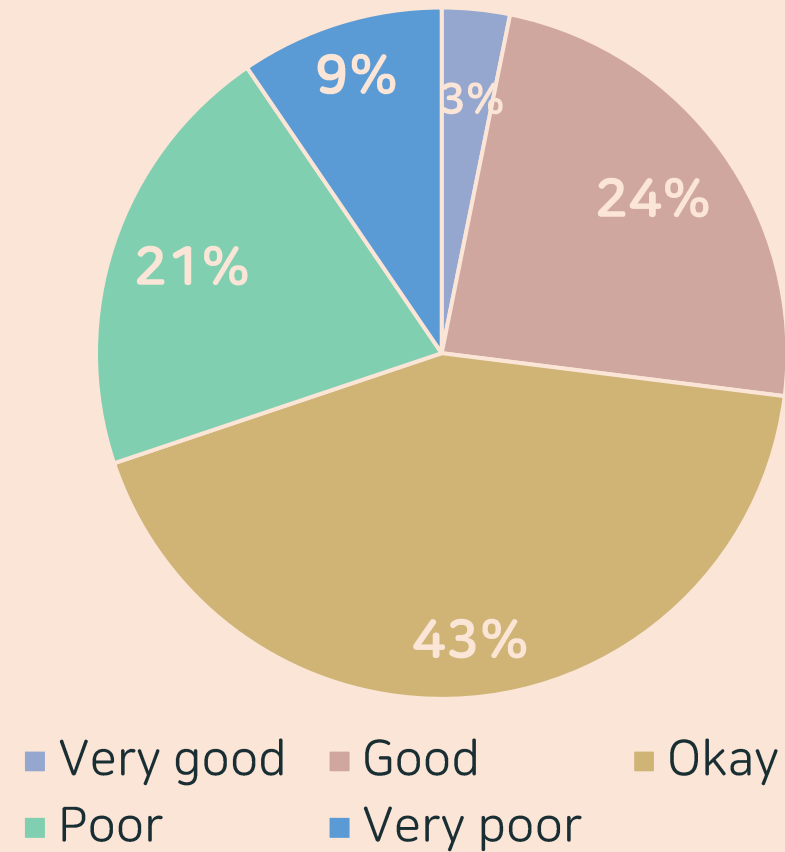
**Q1** Have you ever participated  
in real-time online exams?

: Yes → Q2

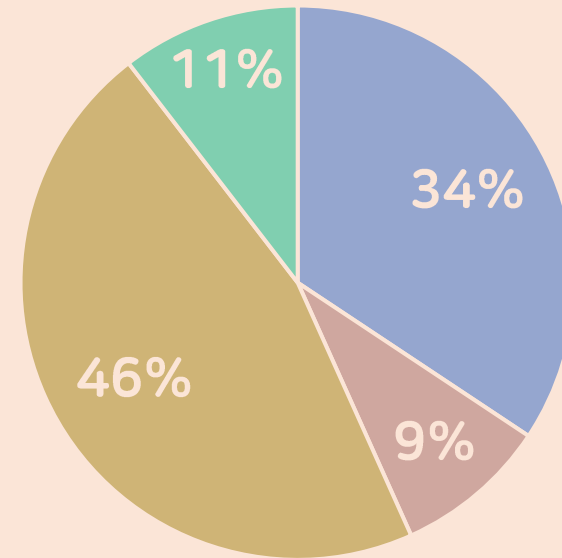


**Q2** Are you satisfied with the real-time online exam?

: Okay / Poor / Very poor → Q3



**Q3** What inconvenience did you experience?



- Network Connection error
- Application Loading Problem
- Cheating Issue
- Etc.



# 1

## Overview Problems

Use too **many resources**  
Ex) RAM, Internet, etc.

Can be a **burden** to  
device with **low specs**

**Complicated**

**Resource-hogging** coming from **bloat**  
Ex) videos of other students

**Not necessary** for exam

**Slow**

**Lag** and Webex **crashing**  
Can **fail** the exam

**Cheating**

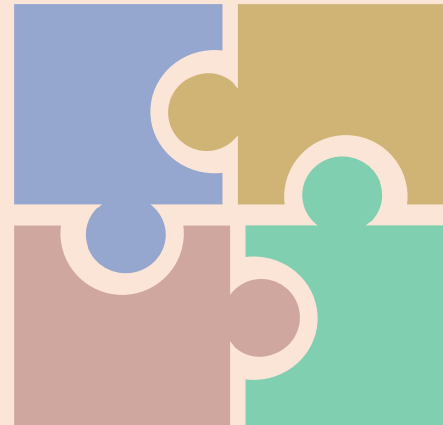
**Muted mic dilemma**  
Muted : easy to cheat  
Unmuted : distracting

Can **circumvent monitoring** using a **blind spot**  
Screen sharing + webcam is not enough

**Difficult**

**Strict Rules**  
Showing both monitor and body

Can cause **awkward position**  
Hard to **place camera**





# Goals

2

Goals

**Final Goal**

**Simple, Easy, Fast, Fair**

Online exam management application

## **Simple, Easy, Fast, Fair**

Reducing the burden on the RAM

Developing the Web/App program to take an exam

Implementing an ability that deliver live video / voice

One-to-one connection between a student and the TA

Cheating prevention – ex. Monitoring students' movements

Providing records of the exam process and video of students

Supportive UI for easier management in university's perspective

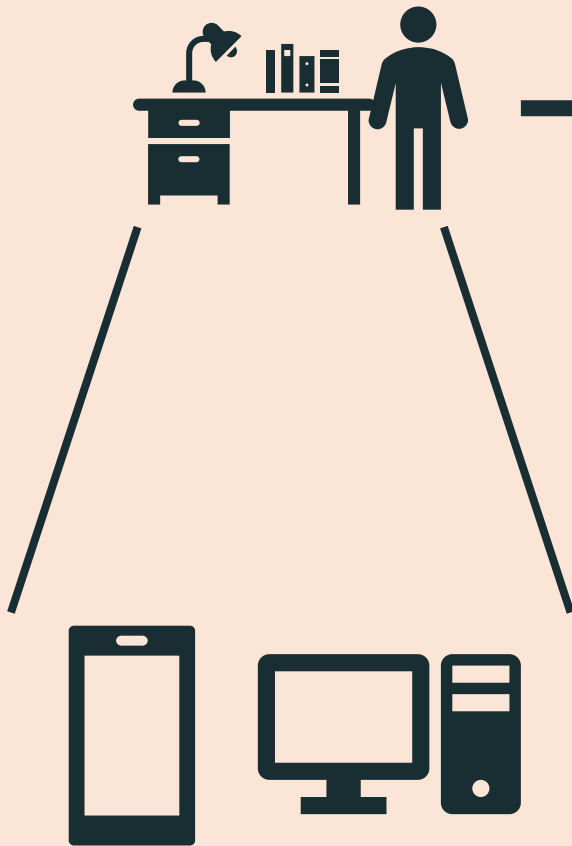


# Methods

## 3

Methods  
Service Flow

User



Server

Live video  
functionRecording  
functionProviding  
easy UI/UXMovement  
detection functionOne-to-One  
connectivityMovement  
analysis function

Database

Log  
fileUser  
InfoAnalyzed  
dataRecorded  
video fileUniversity  
Database

## 3

# Methods

## Service Architecture

### Frontend

Easy UI/UX

Check student movement

Web/app using react & react native

#### Video function

Live video

Video Recording

Move detection

One-to-One connectivity

### Backend

#### Data Transfer API

Rest API

Database access API

#### Video API

WebRTC

OpenCV/OpenPose

Nodejs Server

#### Univ Database

User info & log file

Recorded video file

#### AWS Database

Motion Analysis Data

Recorded video file



3

## Methods Frontend Tools



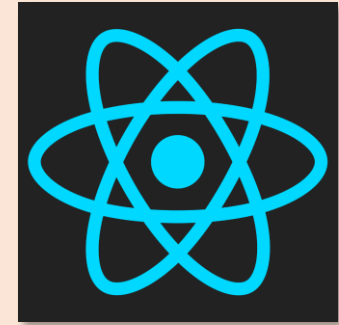
**Adobe PhotoShop**

Designing component



**Figma**

Designing UI/UX



**React & React Native**

Web publishing and  
Android/iOS developing



# 3

## Methods Backend Tools



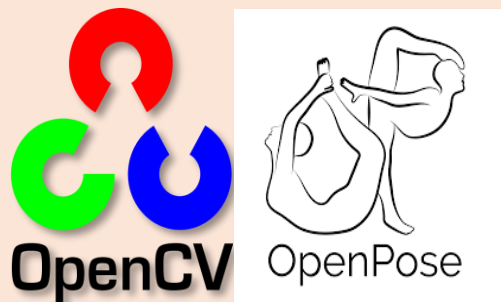
**WebRTC**

Developing video  
conferencing



**Nodejs**

Developing server




**OpenCV &  
OpenPose**

Analysing motion



**AWS**

Server deploying,  
Data collection  
and Management



# **Team & Strategy**

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## Team & Strategy

### Team formation

Kyunghee Ko

#### Android/iOS UX/UI development

Designing the Android/iOS structure

Hyungjun Joo

#### Design web app design

Designing the structure and design of the application

Android/iOS

Web-based

**SKKU**EM  
Development

Luke

#### Android/iOS app development

Implementing Android/iOS app functions

Seungyeon Cho

#### Web app development

Implementing the function of the application

Server

Jeongmin Lee

#### Computer-vision based developer

Developing a program that detects user behavior

Eunsoo Kang

#### Network development

Developing a function that supports 1:1 connection between users and servers.



## Quantitative evaluation of goals

Indicator	Quantative	Importance
Survey on the convenience students after using the program	80%↑	20%
Survey on the convenience of assistants after using the program	80%↑	20%
The percentage of cheating activities that occurred after using the program	3%↓	30%
The percentage of ram usage compared to webex	70%↓	15%
The percentage of network error or application - force- quit compared to webex	50%↓	15%



**Plan & Effect**

## Plans after development



### Expanded application

Can take **offline exams** remotely  
Ex) national examination, certified exam

Even if **Unavoidable / Unexpected circumstances** occurs

Ex) accident, family funeral, natural disasters



### Fix weak points

Development of smartphone's **camera**

→ Can see **wider range**

Development of **computer-vision** technology

→ Get **higher accuracy** of detecting strange behavior

## 5

Plan & Effect  
**Benefit**

TAs &amp; Professors

- **Easy to manage** students while taking exam
- **One-to-one** monitoring possible
- **Automatically save** recorded video during the test
- **No need to detect** strange behavior themselves



Students

- Can take exam on **offline mode** even if a network error occurs
- Don't have to **doubt** others' **cheating**
- **Reduce the burden** of online exams
- **Minimize** the function runs on students' application
- Don't worry about **RAM problem** - Ex) Turn off automatically
- **One-to-one** connection with an TA





**Thank You**