COMP3423 Human Computer Interaction

Assignment 3 Report

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Group Member Information

Name	Student ID	Major Contributions (point form)
Han Wenyu	21097519d	- interview for children, then write down their requirements. - preliminary design of interface by drawing - design division interface, quiz & game for different levels' interface, interface for teacher's manage quiz & class function. - writing UI explanation of UI 3, UI 4, UI 5 - testing: description, survey questions
Zhou Siyu	21094655d	- interview teacher and parents, then write down their requirements - preliminary design of interface by drawing. - design sign in/sign up interface, learning addition/subtraction interface, interface for parent's track, teacher's report, and statistics. - writing UI explanation of UI 1, UI 2, UI 6, UI 7 - testing: survey questions, and result gathering (statistical analysis)

Task 1: Requirement gathering and analysis

The stakeholders of the “Learn Arithmetic” mobile application are mainly divided into three categories: students, parents, and teachers. Therefore, we invited two users from each category to attend an online interview. First of all, we shared the previously designed version with them to experience, which included multiplication learning with them. Then, we collected the usage experience shared by different types of users, as well as suggestions and expectations for subsequent features. Finally, based on the valuable information provided by stakeholders, we organized the functional and non-functional requirements from different perspectives as follows:

Children’s Functional Requirements

1. As children need to register an account in this app, children should do the initial registration with their parents, due to the requirement of email.
2. As children may not have their own device, children and parent may use one device with different mode. Children and parents can log into different modes by changing into different modes.
3. Children can learn addition, subtraction, multiplication, and division by understanding the logic of different calculations in a fun and straightforward way.
4. Children can test their learning by practicing quizzes.
5. Children can adjust the difficulty level of the quiz, to practice at various levels of difficulty.
6. Children can play interactive games with their peers and parents, to consolidate their review knowledge in the learning process.
7. Children can review the learning process, check for gaps in time, and better prepare for future study.
8. Children can review the wrong answer on their own quiz, to review unclear knowledge in time.
9. Students can turn on/off sound and font size within the setting function.

Children’s Non-functional Requirements

1. The system should make sure the information related to account being secure.
2. During the quiz or game, children should get real-time and positive feedback from the system, such as encouragement for correct answers, and hints for wrong answers.
3. The system should make sure that the knowledge and answer provided should be true.
4. The system should make the records of quizzes secure.
5. The processing time for the system should be short, less than 2 seconds.

Parents' Functional Requirements

1. As children need to register an account in this app, parents should do the initial registration with their children, due to the requirement of email.
2. Parents need to know how to instruct children after children do the quiz or games
3. Parents need to know how children do in the quiz during the learning by reading reports.
4. Parents need to know what children have already done when learning basic arithmetic by understanding children's progress.
5. Parents prefer to play games with children to interact and immerse themselves in the progress of how children do the quiz or games.

Parents' Non-Functional Requirements

1. The system should make sure the information related to account being secure.
2. During the game with children, both players should get real-time and positive feedback from the system, such as encouragement for correct answers, and hints for wrong answers.
3. The system should make the records of children's quizzes secure.
4. The processing time for the system should be short, less than 2 seconds.

Teachers' Functional Requirement

1. Teachers need to sign-in and sign-up for their own account for management.
2. Teachers need to read reports to know children's progress.
3. Teachers need to read statistics and distribution for the whole children group.
4. Teachers need to manage children's account in one class (Adding / Deleting children's account)
5. Teachers need to set questions in quiz for students (changing questions, or changing difficulties)

Teachers' Non-functional Requirement

1. The system should make sure the information related to account being secure.
2. The system should make the records of children's quizzes secure.
3. The processing time for the system should be short, less than 2 seconds.

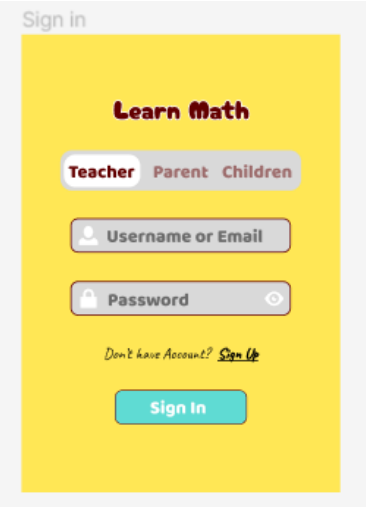
Task 2: Prototyping and Technical Specifications

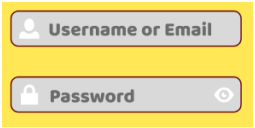
Prototype Link

https://www.figma.com/proto/pJ6336k83UrkjZtNj1EMkX/COMP3423-A3?type=design&node-id=241-4&t=28dh6iPduIjtJeEr-1&scaling=scale-down&page-id=0%3A1&starting-point-node-id=241%3A4&mode=design

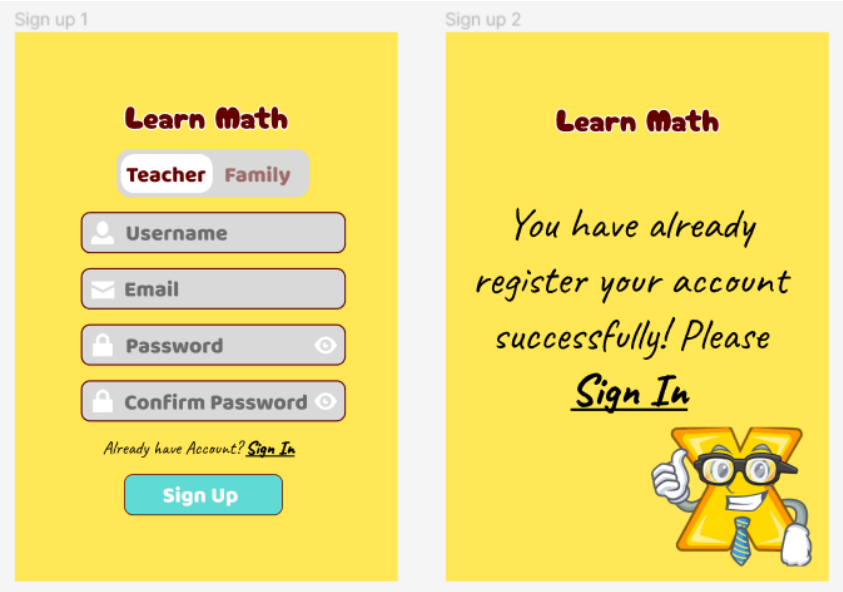
Technical specifications

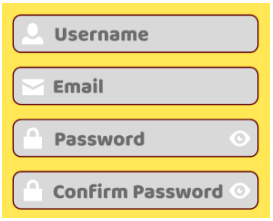
UI 1: Sign-In UI



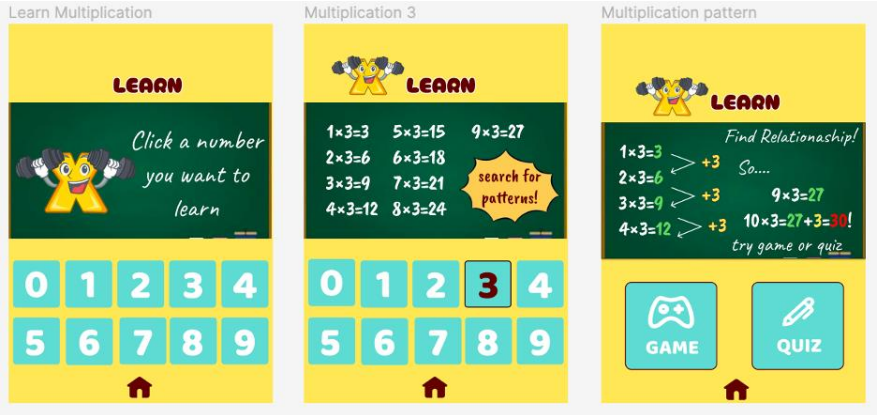
Element	Function	How to Satisfy Requirement	Picture
Toggler to choose (teacher/parent/ children)	Navigate to different home page depending on different stakeholders	Different stakeholders have access to this app, so that different stakeholders can get their own function on their account by changing modes.	
Text Input Box (username/email & password)	System requires username/ email and password to authenticate.	Log-in authentication makes sure the information related to account and records of children's quizzes is secure.	
Sign Up Text Button	Navigate to Sign up page	If someone doesn't have an account, they need to register, then sign in.	

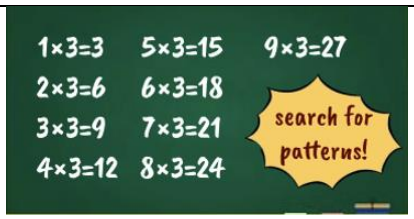
UI 2: Sign Up UI



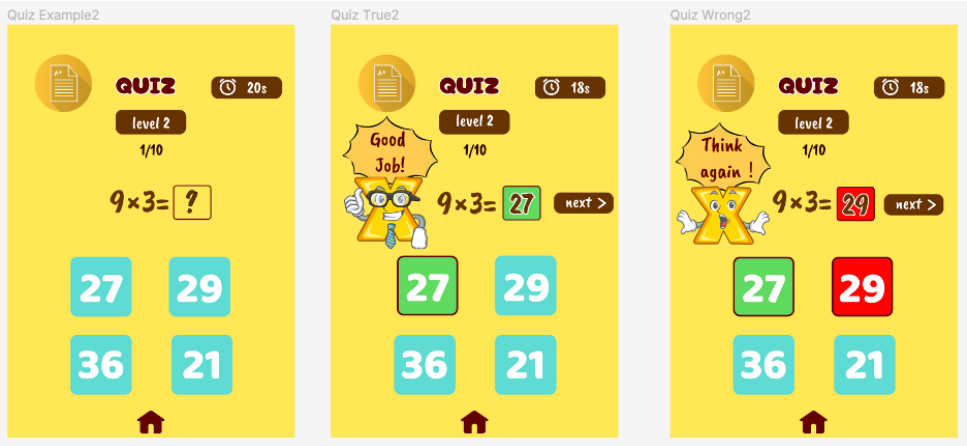
Element	Function	How to Satisfy Requirement	Picture
Toggler to choose teacher/family	Switching between different modes for different stakeholders.	1. If children don't have own email for Sign up, then children may register with parents in family mode, due to the requirement of email. 2. teacher may register his/her own account for management	
Input text box: username/ email/password/ confirm password	1. Get username, email, password for users for authentication in future. 2. Confirm password text box is for user to remember their password.	Input text box save username and password into database, then further need log-in authentication during sign-in part, which make the information related to account and records of children's quizzes secure.	
Sign In Text Button	Navigate to Sign In page.	If someone already have account, and they get into this interface by fault, they directly sign in into the system in sign in page	
Sign In Button (Successful Sign-Up Page)	Navigation to Sign In page after successful registration.	After successful registration, show a successful notification, and navigate user to sign in UI.	

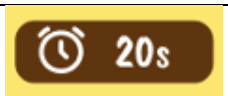
UI 3: Learn-Multiplication



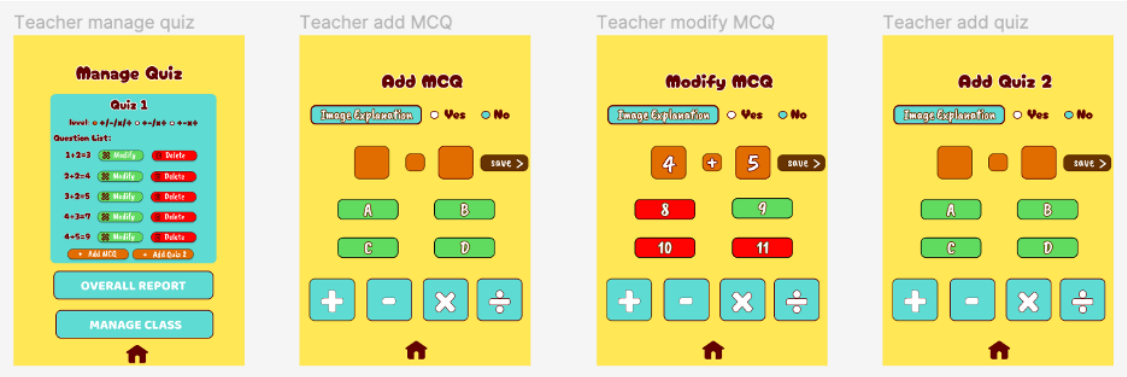
Element	Function	How to Satisfy Requirement	Picture
Select the multiplication numbers that children want to learn	Following the guidance on blackboard, child can click number modules to begin corresponding arithmetic study.	Simple guidelines and cute cartoon images make it easy and user-friendly for children to master in using application, user-friendly.	
Display the corresponding multiplication calculations	Show the multiplication operation for the chosen number on the blackboard.	Clear and accurate presentation of arithmetic results, with selecting number modules color changing. It allows children to get real-time feedback from the application to confirm their choice of number.	
Search for multiplication pattern	Demonstrate the rules of multiplication to help children more quickly understand and apply to operations with larger numbers.	Colorful interface and clear content displays, guide children to develop the learning habit of exploring pattern behind numerical operation.	
Skip to other functions	Click modules on the interface can directly skip to the corresponding interface without returning to the homepage.	Do not need back to the homepage to re-select is more user-friendly. Also, guides children to consolidate their knowledge through quiz and game after learning.	

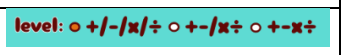
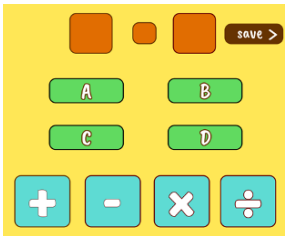
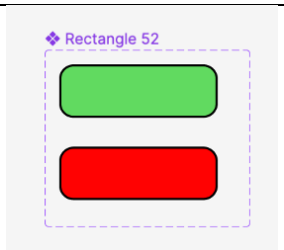
UI 4: Quiz



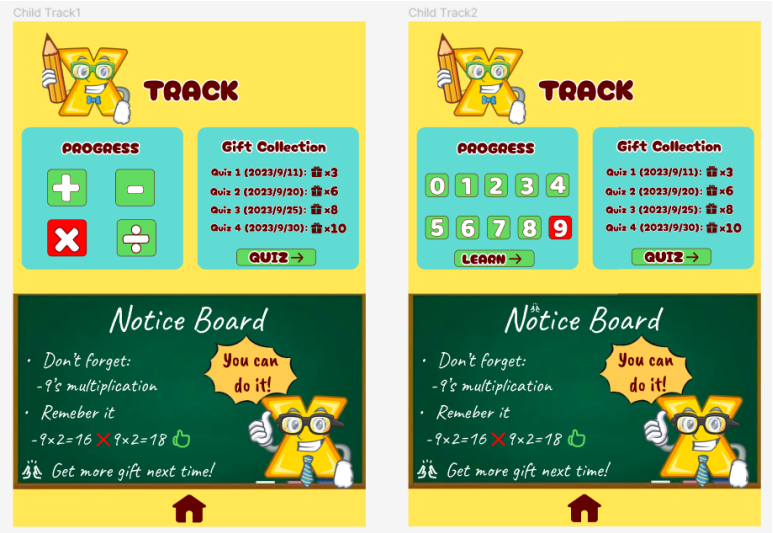
Element	Function	How to Satisfy Requirement	Picture
Count down for answering questions	Remind the children of the time left to answer the current question.	Allow children to get real-time feedback on the application and develop the concept of time.	
Display questions and options	Children read the quiz questions and select the answer they think is correct.	The interface is clear and simple, easy for children to get started.	
Positive encouragement for answering questions correctly	When children make correct choices, the corresponding option turns green and a cartoon image with encouragement appears.	Allow children to get real-time positive feedback on the application. Get motivated to learn with the encouragement of cute images.	
Positive reminder for answering questions incorrectly	When children make wrong choices, the corresponding option turns green and a cartoon image with reminder of thinking again will appear. Also, the correct answer will show by turning green.	Allow children to get real-time positive feedback on the application. Get motivated to learn with reminder of cute image, instead of feeling sad about a wrong answer.	

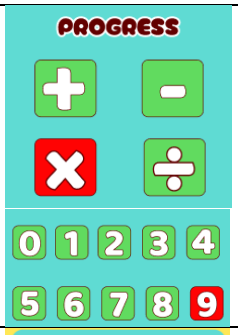
UI 5: Quiz Management



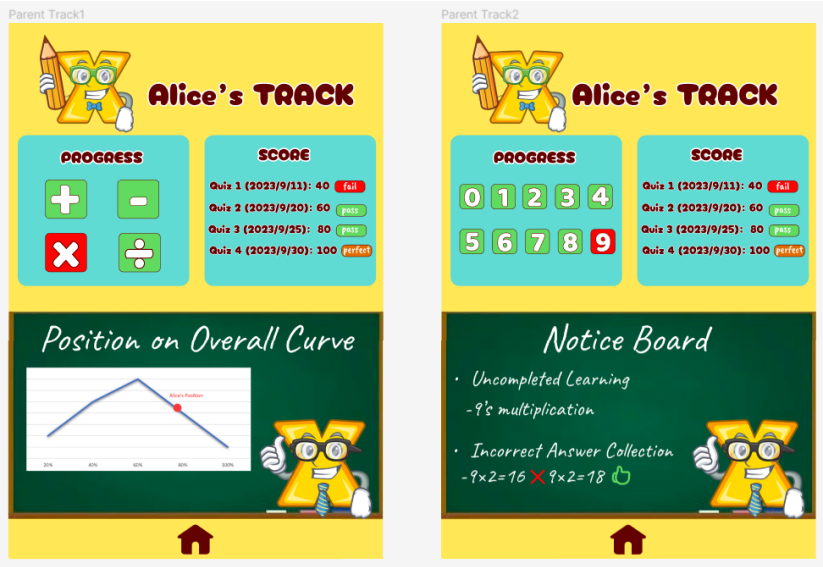
Element	Function	How to Satisfy Requirement	Picture
Choosing quiz level	Teachers can select quiz levels by clicking the corresponding button.	Simple setup for teachers to design quiz quickly and efficiently.	
Modify or delete quiz questions	Teachers can enter the interface of modifying questions and deleting questions by clicking the corresponding button.	The reasonable set of colors corresponds to different functions, which is user-friendly for teachers to quickly understand how to use the application.	
Input number and operator for quiz questions	Teachers can use keyboard that comes with their personal device to enter numbers and drag operator buttons to complete editing.	The simple setup and comfortable interface for teachers to design quiz quickly and efficiently.	
Question saving	Teachers can save the question, which is complete design.	Prompt teachers to save completed edits, to ensure the data is recorded safely and not lost.	
Select image explanation for question	Teachers can decide whether the presentation of the test results should be combined with image explanations or not.	More flexible and varied selection for displaying the quiz results, which is helpful for students to understand arithmetic in an interesting way.	
Red button and green button to design options	Teachers can switch colors (for correct answer and wrong answer) and input numbers to design multiple choices.	The reasonable set of colors corresponds to correct and wrong options, which is user-friendly for teachers to flexible design quiz.	

UI 6-1: Tracking UI of Child mode



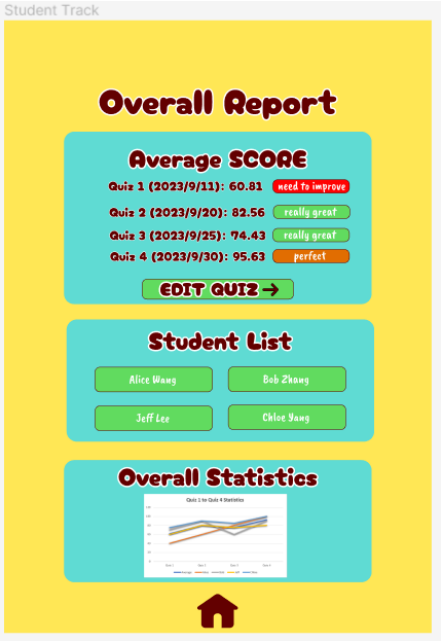
Element	Function	How to Satisfy Requirement	Picture
Red or Green button for number & math symbol	System shows child about what himself / herself doesn't know well about.	Child can review learning process, check for which calculation type have gaps or is uncompleted.	
Gift Collection part	System gives rewards to children	Child can get some gifts from system, and they will be more encouraged to do more questions if there's some rewards	
Notice Board	System reminds child about shortness and uncomplete learning thing during math learning	Child can review learning process by seeing uncompleted learning parts, check gaps in time by know about wrong questions they did.	
Learn button	Navigate to the learning part	Child can choose to learn after check gaps, and know about uncompleted learning parts	
Quiz button	Navigate to quiz part	Child can choose after knowing about the level of quiz done before, if they want to get more gift from system, they can retake the quiz	

UI 6-2: Tracking UI of parent mode



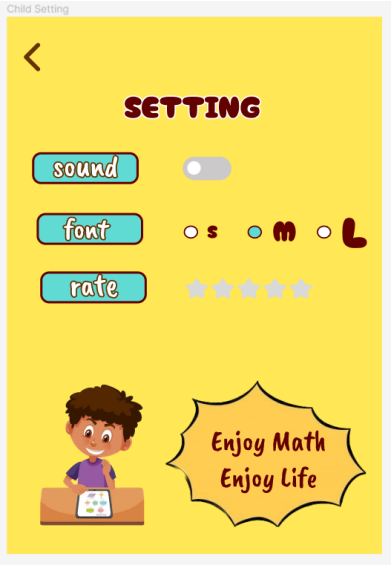
Element	Function	How to Satisfy Requirement	Picture
Red or Green button for number & math symbol	System shows what his or her child doesn't know well about.	Parent can know how children do and what child have already done by reading reports of uncompleted learning parts and wrong questions they did.	
Position on Overall Curve	System shows about the position on overall curve	Parents can know about what their child performs in the whole class, then know how children do in the quiz.	
Notice Board	System remind parent about child's shortness and uncomplete learning thing	Parent can review learning process, check gaps in time, then give child some suggestion or instruct child during learning	

UI 6-3: Tracking UI of teacher mode – Overall Report



Element	Function	How to Satisfy Requirement	Picture
Average Score Part	Show average score of different quizzes	Teachers can know about students' level through reading reports.	
Student List: different student in button	Navigate every student's tracking report of every quiz with position on curve, and shortness, and uncomplete learning things	Teacher can know specific student's progress by clicking, then navigate into individual report (like what tracking UI parent received	
Overall Statistics Part	System shows overall statistics to get a taste from grades of quizzes	Teachers can read statistics and distribution for the whole children group	
Edit Quiz Button	Navigate to editing quiz interface	Teacher can modify quiz or add quiz questions after knowing about student performance on each quiz	

UI 7: Setting UI



Element	Function	How to Satisfy Requirement	Picture
Toggle for sound	switching between sound modes	This toggle enables customization option of setting sound	
Click between font sizes	switching between different font size	This clicks button makes children to see in different font size for customization	
Rating stars	Getting rating grade from different stakeholders	This rating stars makes stakeholders sending different comments and rating to our designers/system developer	

Task 3: Testing

Our ideal testing method is to invite students, parents, and math teachers from a primary school class to experience the interface, then we can observe users' performance and conduct face-to-face interviews. Due to time and resource constraints, we invited users who participated in the interview and experienced the first version again. They would try out the final version of prototype and fill out the questionnaire.

According to the different identity types and primary functions involved, we designed distinct questions for three categories of stakeholders.

Practicality:

- Is the app useful for your/your children's learning?
- Did you know your children's/student's learning progress better?

Design:

- How do you like the design? (Assemble, User-friendly, Colorful, Cheerful, Neat)

Overall experience:

- Overall score you want to give for this app.

Recommendation:

- How likely would you be to recommend colleagues to use?

Comment:

- Any comments for this app?

After we invited 2 children, 2 parents, and 2 teachers to use the prototype, and did the questionnaire. We received the following statistics.

					Total Answer
Question 1(for child & parent): Is the app useful for your/your children's/your students' learning?					6
Very Useless	Useless	Neutral	Useful	Very Useful	
0	0	2	2	2	
Question 2: How do you like the design? (in scale of assemble, user-friendly, colorful, cheerful, neat)					
	Yes	No			6
Assembled well	4	2			
User-friendly	4	2			
Colorful	5	1			
Cheerful	4	2			
Neat	3	3			
Question 3(for parent and teacher): Did you know your children's/student's learning progress better?					4
Yes	No				
3	1				
Question 4(for parent & teacher): Are you willing to let your children/students continue using this app?					4
Yes	No				
2	2				
Question 5: What is your overall score for this app					6
Poor	Below average	Average	Good	Excellent	
0	0	2	3	1	
Question 6(for teacher): How likely would you recommend your colleagues to use it?					2
Very unlikely	Unlikely	Neutral	Likely	Very likely	
0	0	1	0	1	

Task 4: Presentation & Demo

Video URL: COMP3423 A3 Presentation.mov

Appendix: Group work

Meeting 1: Nov. 8th, 12:00 in Library

Discussed:

- What we should do for this project
- We should do interview first then extract user requirements.
- Before next meeting,
    - Zoe should interview teacher and parents, then write down their requirements.
    - Tracy should interview for children, then write down their requirements.
    - We both need to preliminary design of all left app interface by drawing.

Meeting 2: Nov 11th, 12:00 in Lab

Discussed:

- Non-functional requirements for stakeholders
- Interface for children
- Before next meeting,
    - Zoe should have sign in/sign up interface, learning addition/subtraction interface,
    - Tracy should have division interface, quiz & game for different levels' interface.