

University of British Columbia / Emerging Media Lab

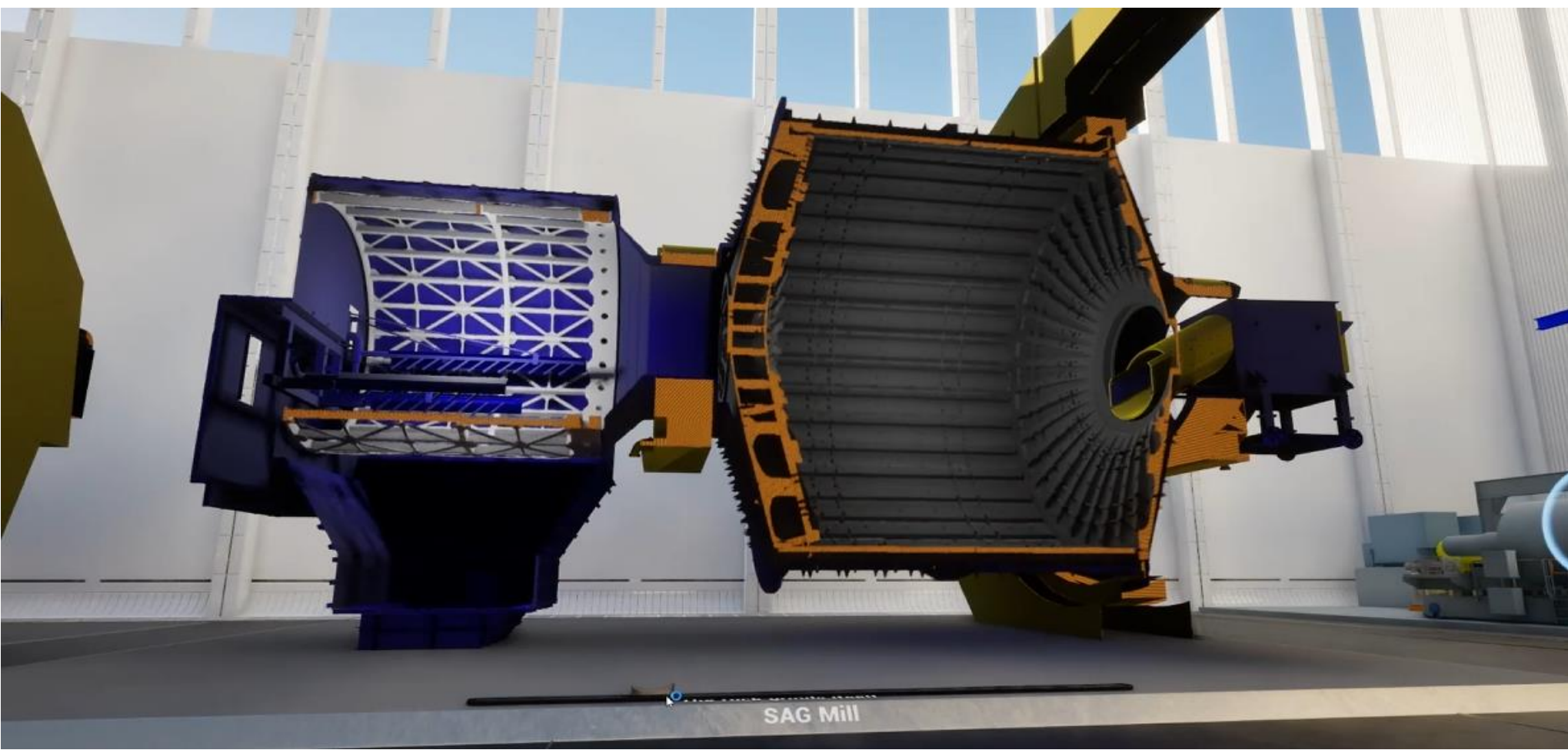
Immersive Education in Mining

Summer 2026

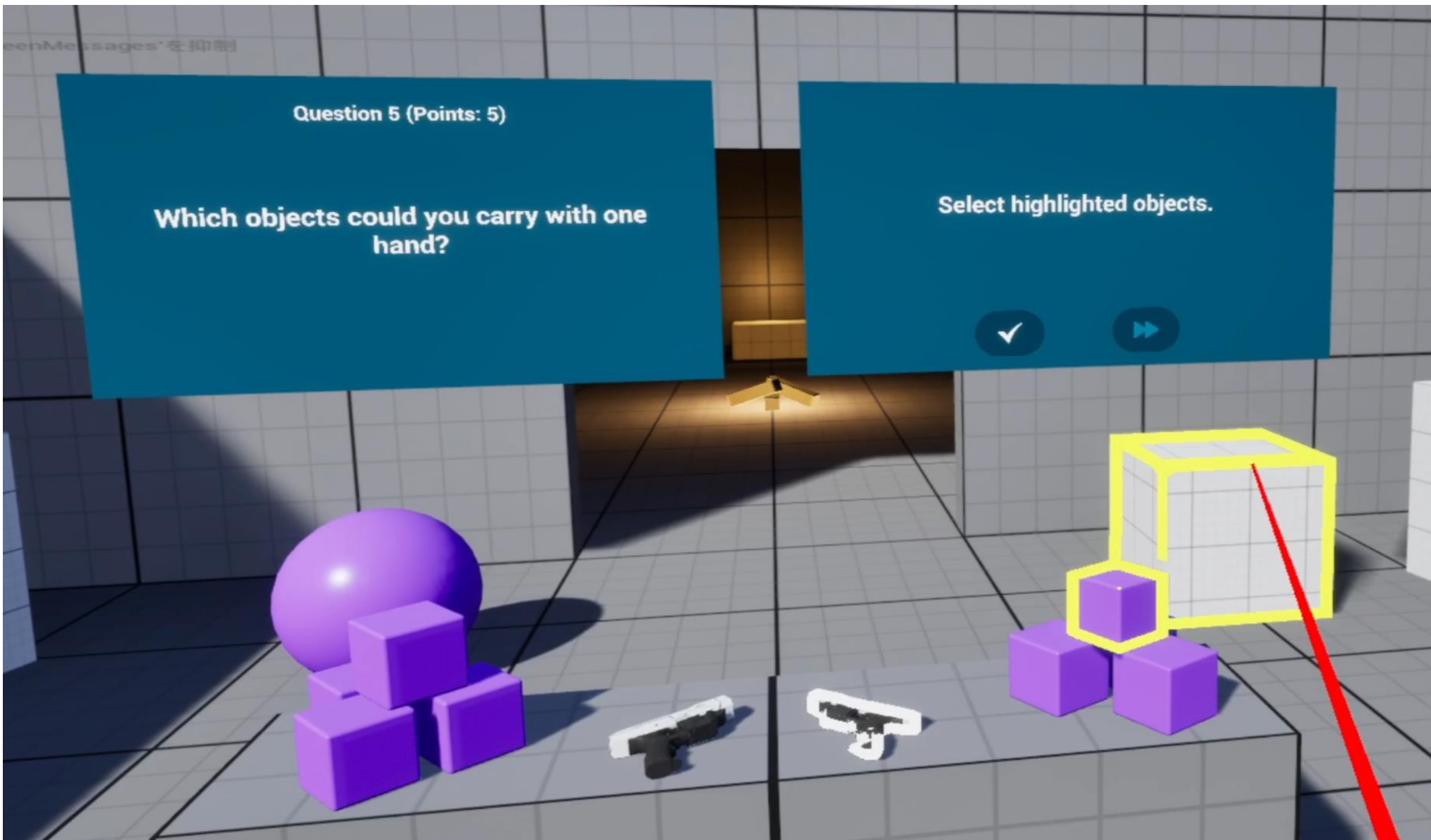
PURPOSE

This project addresses the limited opportunities mining engineering students have for learning about mineral processing and mining equipment in real-world settings. It takes the form of an interactive VR environment, developed in Unreal Engine, in which students can explore a virtual mineral processing facility, engage directly with machinery, and understand their roles within the processing workflow.

In the most recent term, the scope of the project has expanded to include the integration of a customizable quiz system, which course instructors can use to evaluate students on course content. Designed to be content-agnostic, it exists as an Unreal Engine 5.8 plugin with supporting cloud infrastructure separate from the virtual environment itself, allowing other potential Unreal projects to use it in the future as well.



Screenshots from the virtual mining environment, showcasing various site features and machinery.

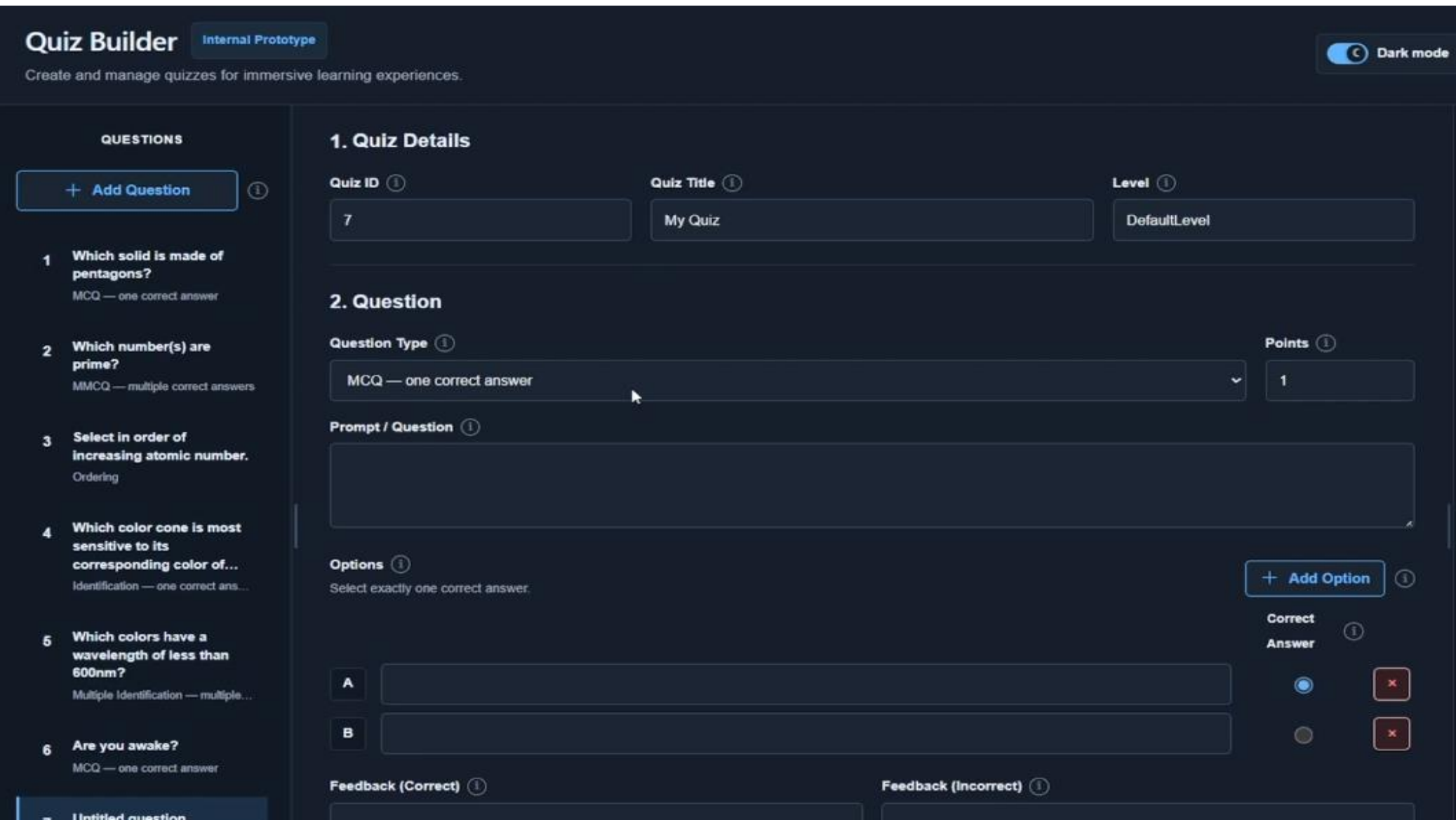


An example of the Unreal Engine quiz interface.

DESIGN CONSIDERATIONS

For the quiz system to be usable by instructors as an effective evaluation method, several factors were discussed with the Mining team and incorporated into the project's architecture, including:

- The practicality of taking a quiz, including whether students are at home or in a lab, whether they are in the presence of other students, and whether it is feasible to always provide a VR headset.
- How quiz results should be handled, considering user confidentiality, immutability, and how instructors will access them.



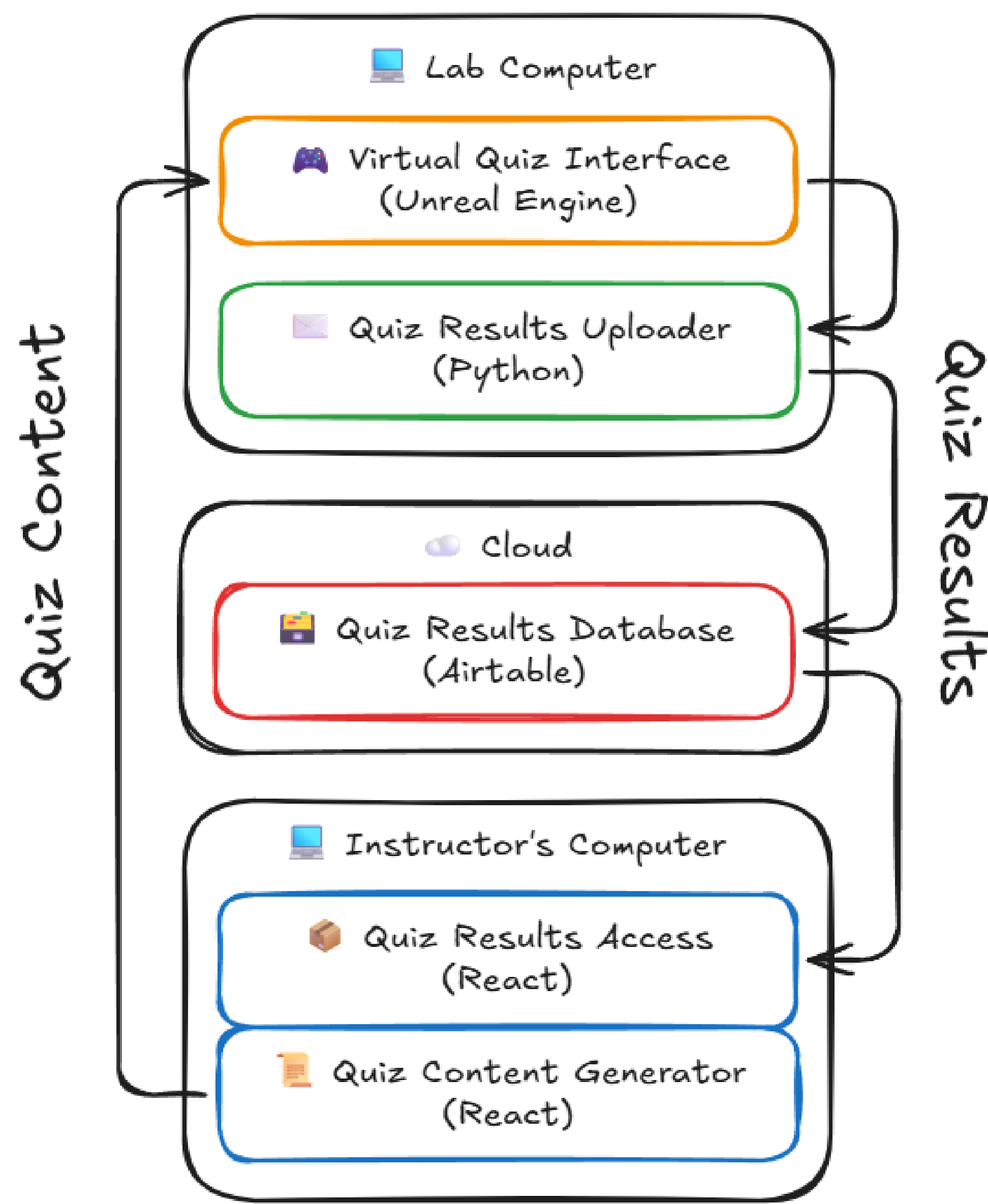
A screenshot of the quiz builder page of the web application.

PROJECT ARCHITECTURE

The project's architecture revolves around the handling of two main types of data:

- The quiz content, which defines the UI the learner sees at test time
- The quiz results, which stores the learner's answers and other details used for scoring and evaluation.

A local web app will assist instructors with generating quiz content files that are compatible with the Unreal Engine plugin. The same web app will allow them to download the accumulated quiz results at the end of the course evaluation cycle. Quiz results are captured, stored on the cloud, and fetched from the cloud automatically according to the architecture diagram outlined below.



Class overview

A summary of the current filtered dataset.

ATTEMPTS

3

Submissions

AVERAGE SCORE

54.2%

Mean result

MEDIAN SCORE

69.5%

Median result

Attempts

Select any row to open the student's full response.

ALIAS	QUIZ	SCORE	RESULT	COMPLETED
Dante	VR Quiz quiz2	4.17 / 6	69.5%	
Khushi	VR Quiz quiz2	5 / 6	83.3%	
Alex	VR Quiz quiz2	0.58 / 6	9.7%	

	A	B	C	D	E	F	G	H	I	J	K
1	Student ID	Quiz ID	Quiz Name	Attempt ID	Score	Max Score	Percentage	Completed At	Uploaded At	Platform	Mode
2	Alex	quiz2	VR Quiz	rec0jWu1	0.58	6	9.7	2026/08/14 22:23	2026/08/14 15:25	VR	Practice
3	Dante	quiz1	VR Quiz	recGsDsro	4.33	6	72.2	2026/08/14 22:24	2026/08/14 15:25	VR	Practice
4	Khushi	quiz1	VR Quiz	recitv0eXj	0.17	6	2.8	2026/08/14 22:24	2026/08/14 15:25	VR	Practice
5	Alex	quiz1	VR Quiz	recKjV8Zop	6	6	100	2026/08/14 22:22	2026/08/14 15:25	VR	Practice
6	Dante	quiz2	VR Quiz	recLqW5Ci	4.17	6	69.5	2026/08/14 22:24	2026/08/14 15:25	VR	Practice
7	Alex	quiz1	VR Quiz	recaqT20w	6	6	100	2026/08/17 17:30	2026/08/17 10:30	VR	Practice
8	Alex	quiz1	VR Quiz	recy6s9dq	6	6	100	2026/08/17 18:44	2026/08/17 11:50	VR	Practice
9	Khushi	quiz2	VR Quiz	recjC91StN	5	6	83.3	2026/08/14 22:23	2026/08/14 15:25	VR	Practice

A screenshot of the analytics page of the web application and of an exported CSV results file.

FUTURE CONSIDERATIONS

Currently the data storage for this project is in Airtable as it provides an easy-to-use document and metadata storage interface for use in applications. For sustainability, this will be changed to a UBC-integrated system.

Additionally, the project may expand further by updating its infrastructure to accommodate for more types of quiz questions to allow instructors to evaluate students more comprehensively.

ACKNOWLEDGEMENTS

Principle Investigators

Tonia Welch, Dr. Bern Klein

Subject Matter Expert

Gonzalo Pizarro

Staff Team

Alex Day, Dante Cerron

Student Team

Khushi Narang



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