

Teacher Participant Information Statement

Research study: Muddy Card AI System - User Study

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1. What is this study about?

Muddy cards are an active learning technique where following the end of a lecture, students will write down the most confusing (muddiest) point from the lecture. Typically, the teacher would read through these responses to understand the most common areas of confusion.

This process can take a very long time. Hence, this research study is about developing a system which speeds up the time it takes for instructors to collect and analyse their students' muddy card responses. We will refer to the overall system as the 'Muddy Card System'.

The 'Muddy Card System' can broadly be separated into two interfaces.

- a. The 'Student Interface' refers to the Canvas survey/quiz students go to enter their muddy card responses and associated inputs
- b. The 'Teacher Interface' is where course instructors will quickly analyse the muddy card responses entered by students for a given week.

In this research study, we aim to use a mixed-method approach to understand the efficacy of this system from the perspective of both the students and teachers. Students will be invited to complete an optional survey, and teachers, optional surveys and an optional interview. Through these surveys, we also aim to understand students and teachers' perceptions of muddy cards in general.

Another main goal for this study is to develop a publicly accessible data set of muddy card responses. This data will be used in this study to benchmark the internal algorithms of the

'Muddy Card System', as well as informing future research. Every time students engage with the interface, they will have the opportunity to opt-in to having their muddy card response and related inputs added to the publicly accessible data set.

Please read this sheet carefully and ask questions about anything you don't understand or want to know more about.

2. Who is running this study?

The study is being carried out by the following researchers:

- Mr. Thomas Elton, University of Sydney.
- Dr. Jonathan Kummerfeld, Senior Lecturer (Computer Science), University of Sydney.
- Dr. Elliot Varoy, Senior Lecturer (Computer Science), University of Sydney.

Thomas Elton is conducting this study as part of his Doctor of Philosophy (PhD) at the University of Sydney.

3. Who can take part in the study?

Any unit-coordinator from the University of Sydney can take part in this study. There may however be a cutoff once a large enough number of unit-coordinators volunteer. Additionally, once the last day to volunteer is reached, we will unfortunately be unable to support any new requests to join the study.

4. What will the study involve for me?

a. Testing the Interface

Prior to the first lecture, you will provide students with a pre-made announcement that we will provide, instructing them how to enter their muddy card responses using the Canvas survey/quiz

When it comes to analysing the responses, you will open a link that opens the Teacher Interface.

- You will be prompted to enter your username and password that you chose when setting up an account on shinyapps.io. If you have trouble logging in, please contact the research team.
- You will upload the muddy card responses that the researchers will place in your unit specific OneDrive (these OneDrive folders will only be shared with the lecturers and unit coordinators for your unit).
- Follow the instructions on the interface to analyse the collected muddy card responses.

b. Weekly Survey

The last page of the Teacher Interface will be a short survey asking you about how you found the system. This survey is optional and you can choose to answer as many questions as you like.

c. Interview

You will be invited to take part in an optional interview with the student researcher.

- The interview will be semi-structured in nature.
- The interview will be performed over Zoom with a transcript created.

d. Survey

There will be an optional survey asking questions to understand your perception of the Muddy Card System and muddy cards in general. The survey will take around 25-30 minutes.

5. How much of my time will the study take?

a. Testing the Interface

Using the Teacher Interface will be an ongoing process. Depending on the specific variant of the teacher interface that you are testing in a given week, we expect it will take between 10-20 minutes.

b. Weekly Survey

The weekly survey should take around 5-10 minutes.

c. Interview

The interview will take around 1 hour.

d. Survey

We expect the survey to take around 15 minutes.

6. Can I withdraw once I have started?

Being in this study is completely voluntary and you do not have to take part.

Your decision will not affect your current or future relationship with the researchers or anyone else at The University of Sydney.

As the unit coordinator, you are able to withdraw from using the Muddy Card System in your classes at any point. If you decide to withdraw, we may potentially ask for your consent to still send out a survey to students in your unit of study to understand the student perception

of the Student Interface and muddy cards in general. However, you would be under no obligation to agree to this.

a. Weekly Survey

Choosing to complete the weekly survey is optional. By submitting your survey, you consent to take part in the study. You can withdraw any time before you submit however once your responses are submitted, they cannot be withdrawn. This is because they are anonymous, and we will not be able to tell which one yours is.

b. Interview

Choosing to complete an interview is optional. Once the interview has commenced, you can choose to end the interview at any time.

c. Survey

Completing the survey is optional. By submitting your survey, you consent to take part in the study. You can withdraw any time before you submit however once your responses are submitted, they cannot be withdrawn. This is because they are anonymous, and we will not be able to tell which one yours is.

7. Are there any risks or costs?

Aside from giving up your time, we do not expect that there will be any risks or costs associated with taking part in this study.

8. Are there any benefits?

Access to the muddy card system is a benefit as it will help in implementing muddy cards into your unit.

There is no compensation for participating in any part of this study.

9. What will happen to information that is collected?

In general, no personal information about you will be collected and used in the study. All data collected in this study will inform research findings which will likely be published.

a. Weekly Survey

- Personal information will not be stored (such as name, email, IP address)
- Survey results will be analysed and the results potentially published.
- All survey results will be securely retained on the university servers for five years.

b. Interview

- Only the research team (i.e. Mr. Elton, Dr. Kummerfeld, Dr. Varoy) will access the audio files to create the transcript.
- Interview transcripts will have your name and other peoples names redacted.
- Other details from the transcript will be redacted where it is likely that otherwise redacting these details would lead to participant reidentification. For example, if you state the course name that you teach, this will be redacted as this is easily linkable information.
- Quotes from your transcript may be included in research publications.
- All data collected from the interview will be securely retained on the university servers for five years.
- The interviewee will be provided with the completed transcript to view. They will then have 3 days to redact any further information before data analysis.

c. Survey Results

- Personal information will not be stored (such as name, email, IP address)
- Survey results will be analysed and the results potentially published.
- All survey results will be securely retained on the university servers for five years.

10. Will I be told the results of the study?

You have a right to receive feedback about the overall results of this study. Any feedback and publications resulting from this study will be available on this website: <https://tjelton.github.io/Dissemination-Muddy-Card-Analysis/>

The public data set of collected muddy cards will also be available through this link.

11. Can I tell other people about the study?

Yes, you are welcome to tell other people about the study.

12. Can I view the student' participant information statement?

Yes you can, and it is encouraged that you read the student participant information statement before agreeing to participate in this study. A link to it can be found [here](#).

13. Will I have access to the Muddy Card System after the research study?

It is too early to tell at this stage. If you had a positive experience using this system, the research team would be happy to share how to run your own version of the system for future units of study.

14. What if I would like more information?

When you have read this information, the student researcher Thomas Elton will be available to discuss it with you further and answer any questions you may have. If it would make you

feel more comfortable, you are also free to email the chief investigator Dr Jonathan Kummerfeld.

- Thomas Elton's email: telt8898@uni.sydney.edu.au
- Dr Jonathan Kummerfeld's email: jonathan.kummerfeld@sydney.edu.au

15. What if I have a complaint or any concerns?

The ethical aspects of this study have been approved by the Human Research Ethics Committee (HREC) of The University of Sydney [ethics reference: [2024/HE001599](#)] according to the National Statement on Ethical Conduct in Human Research.

If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the University:

Human Ethics Manager
human.ethics@sydney.edu.au
+61 2 8627 8176.

This information sheet is for you to keep