

## 1. Introduction

This protocol outlines the methodology for a video-based behavioral analysis of a student interacting with a G4L Course Planner. The focus is on identifying user experience patterns related to navigation efficiency, cognitive load, and emotional responses using synchronized screen and webcam recordings.

## 2. Research Questions

How effectively does the student navigate through the G4L Course Planner interface?

What behavioral signs indicate cognitive hesitation or decision-making difficulty?

What affective reactions are visible during interactions with the system?

## 3. Method

### 3.1 Design

This is a naturalistic video observation study combining screen capture and webcam recording. The method allows us to examine the correspondence between on-screen actions and user reactions (verbal and non-verbal).

### 3.2 Personas

The participant is **two peers of the researcher<sup>1</sup>**, graduate students familiar with digital platforms but new to the G4L Course Planner. Prior experience with similar tools includes university registration systems and academic planning spreadsheets.

### 3.3 Participants

Participant: **Two peers**

Consent: **Full awareness of scope and purpose**

Rationale: Exploratory pilot test before broader user testing

### 3.4 Instruments & Measures

Screen recording software: **Wondershare<sup>2</sup>**

Coding method: Observation coding table using predefined codes

### 3.5 Procedure

Technical setup: **Wondershare**

Tasks: Plan one semester of 3 required courses

**Tell participants: Don't lean forward.<sup>3</sup>**

Variables to code for:

Variable	Measure	Observable Behavior	Code
System Navigation	Path Optimality	Optimal path — minimal steps, direct to goal	O

---

<sup>1</sup> Here we changed the personas and participants because when I was doing the first draft I did not know the video observation protocol design should be tested on two of my peers. That being said, my design was indeed conducted on my peers.

<sup>2</sup> Here we decide not to use Wondershare because the web cam and screen recordings are not synchronized. Currently, it has not been decided which software to use instead.

<sup>3</sup> Here we tell participants don't lean forward because sometimes when the participant leans forward too much, the web cam is not able to record their face's lower half.

Variable	Measure	Observable Behavior	Code
		Detour — multiple irrelevant pages visited, backtracking	D
Cognitive Load	Decision Latency	Quick choice — decision made within 5 seconds	Q
		Hesitation — pause, mouse hover, tab switching > 5s	H
	Verbal Uncertainty	Expressions such as “Where is it?”, sighs, or mumbling	U
Affective State	Facial Expression	<del>Neutral expression</del>	<del>N</del>
		Frown, eyebrow raise (confusion/frustration)	F
		Smile (relief, satisfaction)	S

4

### 3.6 Data Analysis Plan

A timeline-based coding sheet will be used to mark occurrences of each observable behavior using the defined codes. Behavior frequency and sequence will be analyzed. Patterns will be extracted to identify user difficulties. Findings will inform design recommendations for improving the user interface.

---

<sup>4</sup> Here we delete the measure “Neutral Expression” because most of the time the user’s facial expression is neutral.