

# Methods Assignment 1

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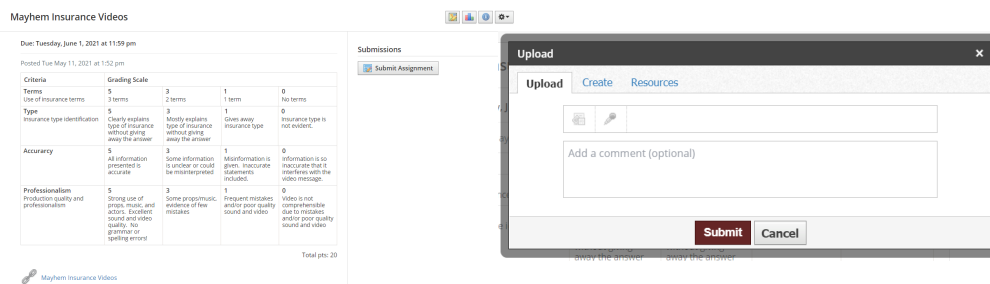
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**Abstract**—Schoology is a learning management software typically used in K-12 educational settings. It integrates materials hosting, digital assessments, discussion platforms, video conferencing, and other technology tools specialized for K-12 classrooms. One task that users struggle with is submitting assignments; particularly those assignments needing to be uploaded from Google Drive. Although a designer must always remember that “you are not your user,” I have come to be familiar with these pain points through my role as a high school teacher at Menomonee Falls High School. This series of assignments intends to redesign the Schoology assignment submission process.

## 1 PROBLEM SPACE

### 1.1 Definition of problem

A regularly used function of learning management systems is submission of assignments. In Schoology, this is a seemingly simple task that causes many problems. From the student side, the assignment page itself lays out the due date, rubric, linked files, settings, comments (if enabled), and a clearly labeled “Submit Assignment” button. When clicked, this button brings up the subsequent submission screen with Upload, Create, and Resources options.

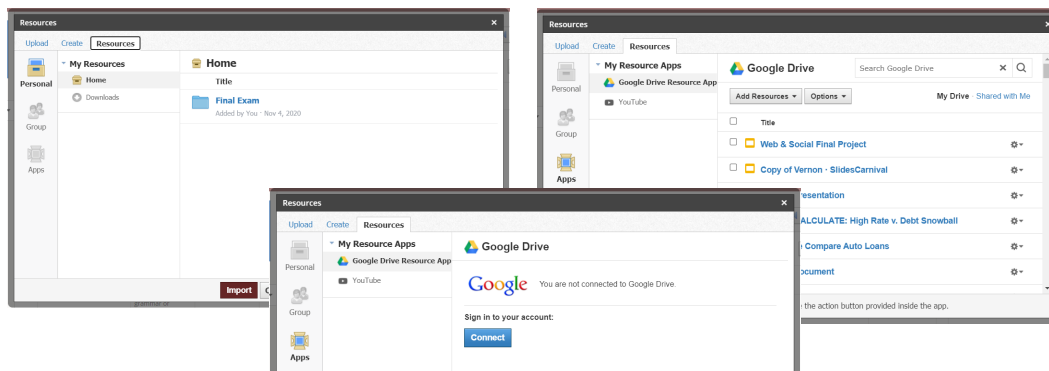


**Figure 1—Upper:** Student perspective of assignment screen for the “Mayhem Insurance Videos” assignment showing rubric, available attachments, and submission button. **Lower:** Default student perspective submission screen.

## 1.1 Definition of problem

In my experience, most students store and submit their assignments from within Google Drive. While it is important to acknowledge that *my* experiences are not identical to all users, it is likely that most students are submitting assignments through some sort of cloud-based storage rather than locally stored uploads (Google Drive, Office 365, etc.). However accessing cloud-based storage within the submission area is cumbersome and unorganized (See Figure 2). To do so, students need to A. select “Resources”, B. “Apps”, C. log into their selected service, D. select the assignment (from a list of files, not organized in any file structure), and E. Upload. The gulf of execution to submit an assignment is too wide, particularly in identifying the tasks that need to be executed. Students struggle in recognizing that they must select “Resources” and then “Apps”, particularly when the language teachers use is “upload the assignment from your Google Drive” (which is very confusing...because there is an upload tab!)

## 1.2 Location in which problem takes place



**Figure 2:** To upload a cloud-based assignment, students must *Left:* Select the “Resources” tab, *Middle:* Select the “Apps” button and log in, and *Right:* Select file (no folder structure) and upload.

## 1.3 Segment of the target domain proposed for development

The target domain that will be developed for this project is the assignment submission feature within the Schoology Learning Management system, with particular focus on narrowing the execution gulf.

## **2 USER TYPES**

### **2.1 Primary stakeholders: Student users**

For the specific task of submitting assignments, the users are K-12 students. Demographically, these students encompass all genders and races, and fall into the age category of (officially) 5-18, but most often grades 9-12, which is ages 15-19 in traditional U.S. high schools. Their levels of expertise range from novice to expert as students progress through the school system. Most incoming students will not come in with prior Schoology experience, but with consistent daily use across many classes they gain expertise quickly.

Motivations for submitting assignments are primarily based on grades and eventual high school graduation: students know that submitting assignments incrementally helps them achieve grades/credits which contribute to their high school diploma. Alternatively, this could also be looked at as a motivation to demonstrate knowledge in order to further progress within the education system.

### **2.2 Secondary Stakeholders: Teachers**

Although teachers are users of Schoology to create lessons, upload materials, etc., for this design task they are secondary stakeholders. They do not submit assignments, rather only interact with the output of a submitted assignment. As such, they will not be considered in the redesign process.

## **3 NEEDFINDING PLANS**

### **3.1 Needfinding plan 1: Participant observation**

#### **3.1.1 *Description of Plan***

*What will I do?*— As a participant, I will engage in the activity of submitting mock assignments to Schoology.

*What steps will I follow?*— I will enroll in a sample Schoology course and try to submit the following types of assignments: A. Local file upload; B. Cloud-stored file; C. Submission created “on the spot” within Schoology; D. Submitting multiple files (of same type and mixed types); and E. Resubmission. While doing so, I will take notes on the process.

***What data will I gather?***— The data I gather will be qualitative observations of the following for each activity. Please see the planned notes sheet to use for data collection in Appendix 5.1.

- What worked as I expected?
- What did not work as I expected?
- Are there any hacks/workarounds I find myself gravitating towards? (i.e. desiring to break out of the interface to accomplish the task in an easier way and/or using the interface in an unintended way)

It is important to note here that I am not my user. Thus, the primary purpose of this needfinding exercise is to inform me of what to best ask actual users in a future need finding.

### ***3.1.2 Connection to Data Inventory***

Participant observation consists of practicing executing the same tasks as the user as well as taking notes on the process. This best connects to the following data inventory aspects:

- *What are their tasks?* By actually attempting the submission process, I am able to identify what a user is doing physically, cognitively, and socially.
- *What are their subtasks?* Through practicing submitting, I am also better able to identify and understand the intermediate steps a user takes to do so in a real submission process.

### ***3.1.3 Potential Biases***

- *Confirmation bias:* Given my experience using Schoology as an educator, I may have preconceived ideas of where I have observed my students struggle with submitting assignments. I intend to limit this by specifically looking for aspects of the interface that *do* function as I expected (see Appendix 5.1, note-taking guide) as well as by involving multiple individuals in the other need-finding processes.
- *Functional fixedness (anchoring bias):* This bias “limits a person to using an object only in the way it is traditionally used” (Wikimedia Foundation, 2021), or, in my case, limiting my participation to the methods I am most familiar with. To combat this, I am specifically including types of submissions that I do not use with my students (local file uploads and “on demand” submissions).

- *Illusion of validity*: Defined as a “tendency to be overconfident in the accuracy of our judgements,” (The Decision Lab, 2021) the illusion of validity could occur because of my own familiarity with Schoology. Since I have experience with the tool, I may be biased to believe my judgements are accurate and applicable to all users. To overcome this, it will be important for me to involve others (particularly those with different user experiences), as well as employ a variety of needfinding methods.

## 3.2 Needfinding Plan 2: Surveys

### 3.2.1 Description of Plan

*What will I ask?*— Based on my results from participant observation, I will craft a survey inquiring on users experiences in submitting assignments in Schoology. Appendix 5.2 is current draft, as well as questions listed and explained below:

1. How would you rate your experience level in using Schoology?
  - a. Answer type: Radio button with numeric scale: 1) novice, 2) familiar, 3) experienced
  - b. Purpose: To identify if experiences differ across experience levels
2. When you submit assignments to Schoology, identify how often you use the following types of submissions: local file upload, cloud-based storage submission, on-demand submission creation
  - a. Answer type: Grid multiple choice for Usually/Most of the time, 3-5 times/semester, Rarely/never used
  - b. Purpose: To identify the submission tasks users most commonly need (allows the users to be expressive)
3. In a typical week, how many times do you use the assignment submission feature within Schoology?
  - a. Answer type: Radio button for 0, 1-2, 3-4, 5-6, 7 or more
  - b. Purpose: Informs of context of use (how often feature is needed)
4. Think back to the first time you submitted an assignment to Schoology. What (if any) elements did you find confusing?
  - a. Answer type: Open ended response
  - b. Purpose: Attempts to allow users to be expressive without implying they *did* find anything confusing
5. What (if any) changes would improve your experience in submitting assignments to Schoology?

- a. Answer type: Open ended response
- b. Purpose: Attempts to allow users to express what would improve their experience, without implying any changes are needed

***Who will I send the survey to?***—First I will procure parental permission (since students are in a K-12 learning environment) to allow for consent for participation. I will then administer the survey specifically to AP Computer Science Principles students I teach at Menomonee Falls High School. It is fully acknowledged that such a small audience is extremely susceptible to bias, however, at the very end of the school year taking *any* amount of class time is an extremely large ask of other teachers, and in this AP course I am able to allot time as students have just finished their AP exam.

### **3.2.2 Connection to Data Inventory**

A strong survey will have each question connected explicitly to a data inventory item. The following details each question's specific connection:

1. *Who are the users?*: Experience level will help me understand who the users are, and more specifically how their defining characteristics may relate to their needs from the interface.
2. *What are their tasks? And What are their subtasks?*: Asking how frequently a user makes use of different submission types helps identify their specific tasks as well as the subtasks needed to complete that type of submission. It will inform me of which interface features are most needed by users.
3. *What is the context of the task?* Inquiring on frequency of use helps me to understand the context of how often this feature is used and (if problems exist) how frequently the user encounters those problems.
4. *What do they need?* Initial struggles in using the tool inform me of needs.
5. *What do they need?* By asking about what (if any) changes a user would recommend, I am inquiring on what their needs are.

### **3.2.3 Potential Biases**

- *Recall bias*: This survey asks users to recall how they have felt when using Schoology in the past, and the recall bias ascertains that this data is not always the most accurate or complete. To counteract this, I will also be performing needfinding think alouds so that I may study the task performed in context.

- *Social desirability bias*: Because students will know that I (their teacher) will be receiving their feedback, they may be motivated to respond positively to please me. To combat this, I will request review from peers/colleagues to ensure the questions are phrased in such a way that participants are not implicitly pressured to answer one way.
- *Voluntary response bias*: An important consideration in voluntary surveys is that the most extreme opinions are often most recorded, as these are the individuals who are most motivated to respond. To compensate, I will not show users the survey content before they begin and instead only estimate a time commitment (no more than 15 minutes).
- *Compassion fade*: Defined as “the predisposition to behave more compassionately towards a small number of identifiable victims” (Wikimedia Foundation, 2021). I am susceptible to this bias because the individuals I am surveying are students whom I work with, and it is possible I will overvalue their opinions. Essentially, I may think that their needs/struggles are universal when they really are not.

### 3.3 Needfinding plan 3: Think aloud

#### 3.3.1 Description of Plan

*What will participants do?* — Participants will demonstrate three different submission tasks and answer questions during and after. The three tasks are: A) submitting a local file, B) Submitting a cloud-based file, and C) Submitting an “on demand” file. I intend to complete think alouds with five (5) student users, after procuring parent consent. Ideally, these five users would fit the following categorical characteristics:

- 1-2: Highly experienced user: 3-4 years experience, daily use, encounters few struggles because they know the ins and outs of the system
- 2-3: Familiar user: ~2 years experience, familiar with interface but may experience frustrations
- 1-2: Novice user: 0-1 years experience, unfamiliar with interfaces/tasks

*What will you ask them while or after they do it?* — See script in Appendix 5.3

- For each task:
  - Please tell me the steps you are taking to perform Task X.
    - Note hesitations, confidence in stating/executing steps, etc.

- Where (if anywhere) do you think a new user may get stuck?
- What (if anything) could make this process easier?
- What would you do if you needed to make changes after you submitted something?
- How would you submit a multi-part assignment?
- Which method did you find easiest to execute?

### 3.3.2 *Connection to Data Inventory*

Think alouds consists of using the script to ask users to demonstrate and describe tasks as well as taking notes on the process. This best connects to the following data inventory aspects:

- ***What do they need?:*** Because users will actually be submitting assignments, this needfinding task considers the supplies they need: computing device (desktop workstation, Chromebook, etc.), as well as internet access, and assignments to submit.
- ***What are their tasks and what are their subtasks?:*** In actually asking the users to perform several different submissions, I am gaining insight into the tasks of submitting as well as the specific subtasks to accomplish this.

### 3.3.3 *Potential Biases*

- ***Observer bias:*** Through interacting directly with users, I may influence their actions because they know I am observing them. This may lead users to give answers they think I want to hear. I will work to counteract this by using a precise script for all interactions with users (to ensure consistency across think aloud experiences, as well as by asking a colleague to review my scripts for leading questions.
- ***Experience bias:*** Although not an “official” form of bias, it should be noted that the students that are available for me to complete a think aloud with are those that are enrolled in AP Computer Science Principles. Thus, these students likely have stronger computing/technology skills than the average student. I will counteract this by specifically scripting to ask users how they think a new user (one unfamiliar with Schoology) would feel.



## 4 REFERENCES

### Information Sources:

1. *Illusion of validity - Biases & Heuristics*. The Decision Lab. (2021, February 26). <https://thedecisionlab.com/biases/illusion-of-validity/>
2. Wikimedia Foundation. (2021, March 6). *List of cognitive biases*. Wikipedia. [https://en.wikipedia.org/wiki/List\\_of\\_cognitive\\_biases](https://en.wikipedia.org/wiki/List_of_cognitive_biases)

### Image Sources:

1. 2021. *Schoology*. [Web Application]. Schoology. <https://www.schoology.com/>

## 5 APPENDICES

### 5.1 Participant observation qualitative notetaking guide

This is the note guide I intend to use when engaging in participant observation.

Task	Worked as Expected	Did Not Work as Expected	Hacks/ Workarounds Discovered
Submitting a local file			
Submitting a file from cloud storage			
Submitting “on the spot” (creating and submitting shortly thereafter)			
Submitting multiple files (of same type and of different types)			
Resubmitting			

## 5.2 Student survey

This is the current draft of the survey that will be administered to ~30 students.

*Survey Link:*

[https://docs.google.com/forms/d/e/1FAIpQLSe\\_AdozzwBXVWi07U6-IuuDBjzqDI-RS-sy3XDkZm2O9k1eyAQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSe_AdozzwBXVWi07U6-IuuDBjzqDI-RS-sy3XDkZm2O9k1eyAQ/viewform?usp=sf_link)

*Survey Screenshots:*

**Submitting Schoology Assignments**

**Informed Consent:**  
You are asked to be a volunteer in a research study.

**Purpose:**  
The purpose of this study is to understand how students feel about submitting Schoology assignments. You will be asked to complete a short survey for this study. Your participation is expected to last no more than 15 minutes. We expect to enroll 30 people in this study.

**Risks or Discomforts:**  
The risks involved are no greater than those involved in completing a short online survey.

**Benefits:**  
While you will not benefit directly or immediately from participating in this study, we intend to use the data we gather to improve our digital proctoring practices, which will benefit all students who have to use digital submissions in their classes.

**Storing and Sharing your Information:**  
By participating, you consent for your de-identified information/data to be stored by the researcher and to be shared with other researchers in future studies. If you agree to allow such future sharing and use, your identity will be completely separated from your information/data. Future researchers will not have a way to identify you. Any future research must be approved by an ethics committee before being undertaken.

**Questions:**  
Please direct any questions to Lead Researcher Laura Schoenike ([lschoenike3@gatech.edu](mailto:lschoenike3@gatech.edu))

**Questions about Your Rights as a Research Participant:**

- Your participation in this study is voluntary. You do not have to be in this study if you don't want to be.
- You have the right to change your mind and leave the study at any time without giving any reason and without penalty.
- Any new information that may make you change your mind about being in this study will be given to you.
- You will be given a copy of this consent form to keep.
- You do not waive any of your legal rights by signing this consent form.

**If you consent, please proceed to the next section.**

**Next**

# Submitting Schoology Assignments

## Questions

How would you rate your experience level in using Schoology? 1: Novice, 2: Familiar, 3: Experienced

	1	2	3	
Novice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Experienced

When you submit assignments to Schoology, identify how often you use the following types of submissions: local file upload, cloud-based storage submission, on-demand submission creation

	Usually/most of the time	3-5 times/semester	Rarely/Never Used
Local file upload	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cloud-based storage submission (i.e. Google Drive, video uploaded to YouTube, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On-demand submission creation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In a typical week, how many times do you use the assignment submission feature within Schoology?

- ☐ 0
- ☐ 1-2
- ☐ 3-4
- ☐ 5-6
- ☐ 7 or more

Think back to the first time you submitted an assignment to Schoology. What (if any) elements did you find confusing?

Your answer

---

What (if any) changes would improve your experience in submitting assignments to Schoology?

Your answer

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[Back](#)

[Submit](#)

### **5.3 Think aloud script**

This is the script to be used in think-aloud interviews after confirming parent and student consent to participating.

#### **5.3.1 *Prior Set Up***

Set up a computing workstation and mock Schoology course/assignment placeholders for the various tasks.

#### **5.3.2 *Script***

Hello, thank you for agreeing to participate in this research study. As a reminder, your participation is voluntary and you do not need to answer any questions you do not wish to. By participating, you consent for your de-identified information/data to be stored by the researcher and to be shared with other researchers in future studies.

#### **Task A: Submitting a local file**

First, could you please show me the steps to submit a locally stored file? There is a file called “Example1.txt” on the Desktop for you to submit to the Task A assignment. As you’re performing the steps, please tell me the steps you are taking. (Note hesitations, confidence in stating/executing steps, etc.)

Where (if anywhere) do you think a new user may get stuck?

What (if anything) could make this process easier?

#### **Task B: Submitting a local file**

Next, could you please show me the steps to submit a cloud-based file? There is a Google Doc called “Example2” shared with you to submit to the Task B assignment. As you’re performing the steps, please tell me the steps you are taking. (Note hesitations, confidence in stating/executing steps, etc.)

Where (if anywhere) do you think a new user may get stuck?

What (if anything) could make this process easier?

#### **Task C: Submitting on-demand**

Next, could you please show me the steps to create and submit an assignment right now? Think of a scenario where your instructor gave an on-demand essay and you were going to write and submit the assignment immediately. As you're performing the steps, please tell me the steps you are taking. (Note hesitations, confidence in stating/executing steps, etc.)

Where (if anywhere) do you think a new user may get stuck?

What (if anything) could make this process easier?

**After all tasks:**

What would you do if you needed to make changes after you submitted something?

How would you submit a multi-part assignment?

Which method did you find easiest to execute?