
Usability of the Rice Coffeehouse Rinsing Station

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Introduction

- Allows customers to rinse and air-dry their mugs
- Intended to reduce waste (paper coffee cups)
- Uses a rinsing spray in which you push an inverted mug onto the spray
- Two drying locations: pegs on the right and a wire rack in the center



Test Objectives

1. Can users use the high power spray?
2. How long does it take the users to clean a mug with the device?
3. Would an instruction sheet make the users quicker and more successful in using the device?
4. Do users prefer using the overhead rack or the side pegs to leave their mugs?
5. What is the condition of the device after the average user cleans his/her mug with the device?

Assessments

1. Heuristic Assessment
 - a. Nielsen and Molich (1990)
2. Cognitive Walkthrough
3. Testing

At the time of the heuristic assessment and cognitive walkthrough:

- Polycarbonate pegs were not yet applied
- Lack of an instruction sheet
- Lack of water and drainage lines

Heuristic Assessment

#	Problem	Severity	Heuristic Label
1	Identification of Personal Mug	3	Provide Sufficient Feedback; Minimize the users' memory load
2	Device Instructions	3	Provide Help and Documentation
3	Ease of Cleaning	2	Available and Appropriate Shortcuts
4	Mug Space	2	Provide Sufficient Feedback
5	Confusion of Shelf Purpose	2	Be Consistent
6	Lack of a Chalk/Eraser/Rag holder	1	Available and Appropriate Shortcuts

Cognitive Walkthrough

2 sets of users: Coffeehouse customers and coffeehouse employees

- Only Coffeehouse customer users were tested

Task list for Coffeehouse Employees

- A. Remove top wire rack by lifting vertically upward
 - B. Wipe down the water collecting tray beneath wire rack
 - C. Vertically lower the top wire rack down onto the handles
 - D. Cleaning the water collecting tray beneath the lid tray
 - E. Placing items in storage (if applicable)
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Cognitive Walkthrough

Task list for Coffeehouse customers

- A. Dump remaining drink into sink
 - B. Press the mug upside down on high pressure spray.
 - C. Remove mug from high pressure spray after 3-5 seconds
 - D. Press mug lid down on high pressure spray (if applicable)
 - E. Remove mug lid from high pressure spray after a few seconds
 - F. Place the mug in storage
 - G. Place the mug lid in storage
 - H. Retrieving mug and lid
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Methods

- Participants: 9 total
 - 2 pilot participants
 - Average age: 26 years old
 - 2 groups: participants were given either an instruction sheet or no instructions
1. Consent form
 2. Background questionnaire
 3. Task: to clean a mug (and lid) containing coffee and store it on the device.
 4. SUS
 5. ASQ
 6. Follow up questions
 7. Debrief

Task List: Coffeehouse Customers

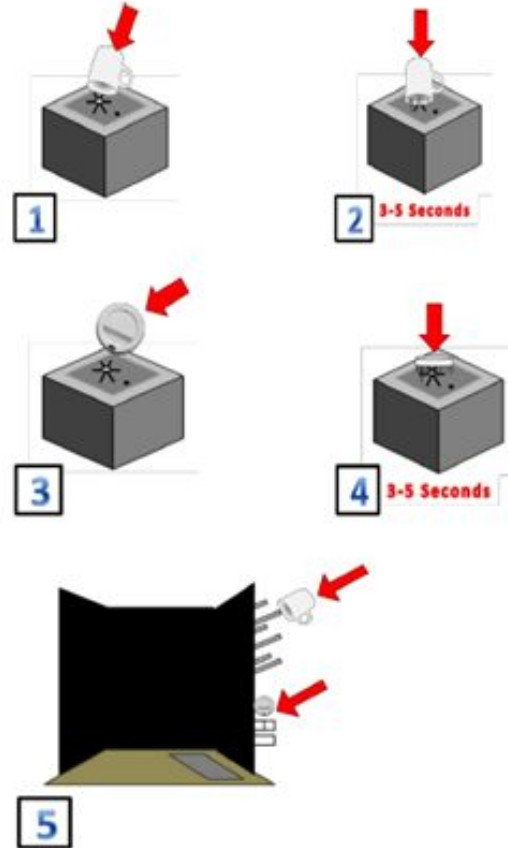
Cleaning

- 1.1 Clean the mug
 - a. Dump the remaining drink into the sink
 - b. Press the mug down on the high power spray
 - c. Remove mug from high power spray
- 1.2 Clean the lid
 - a. Press mug lid down on the high power spray
 - b. Remove mug lid from high power spray

Storing

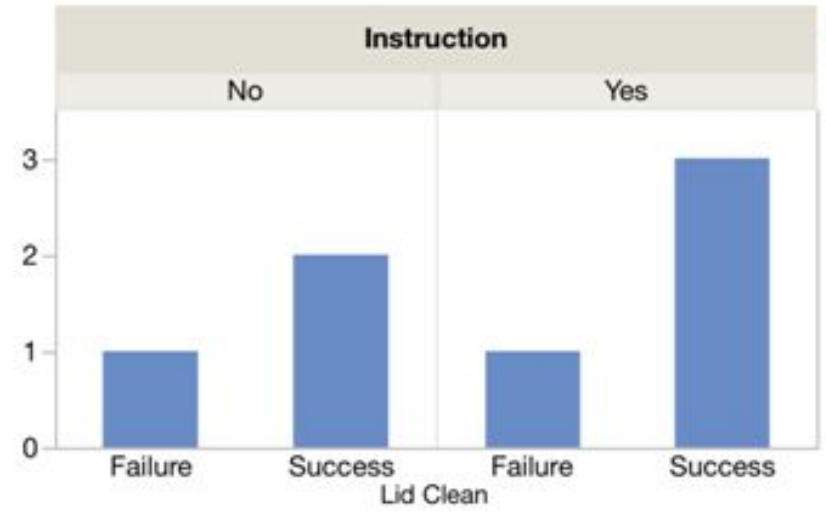
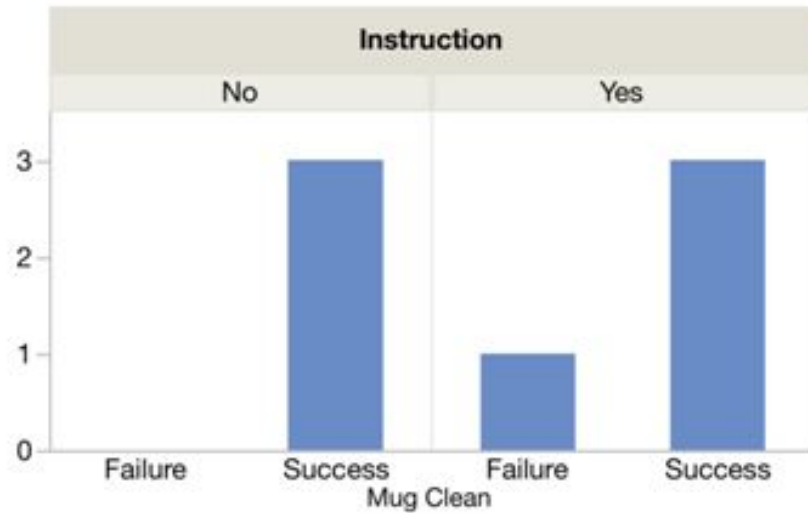
- 2.1. Place the mug in storage (the rack above the sink on the front wall or the pegs on the right wall)
- 2.2. Place the mug lid in storage (in the lid space on the right wall)

Provided Instruction Sheet



Results: Effectiveness

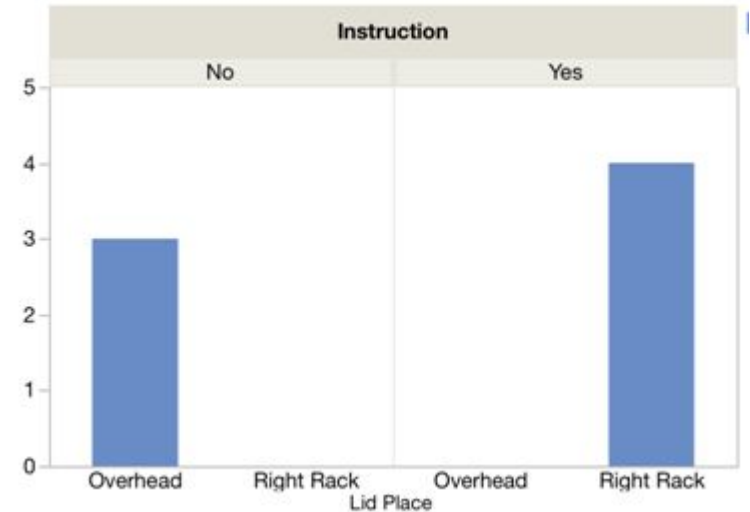
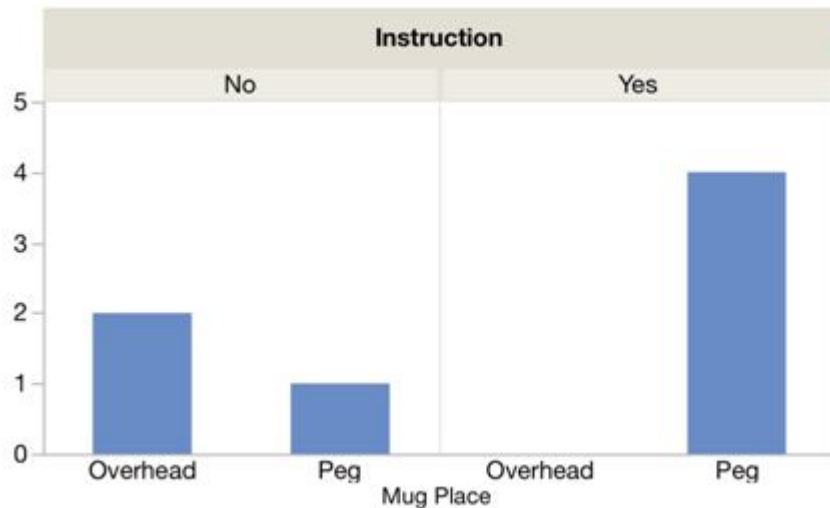
Rinsing: 5 out of 7 participants cleaned the mug and lid successfully



Results: Effectiveness

Storage: everyone in the “instruction” condition placed items in the correct place

- Those with no instructions varied in the placement (partial success)



Results: Efficiency

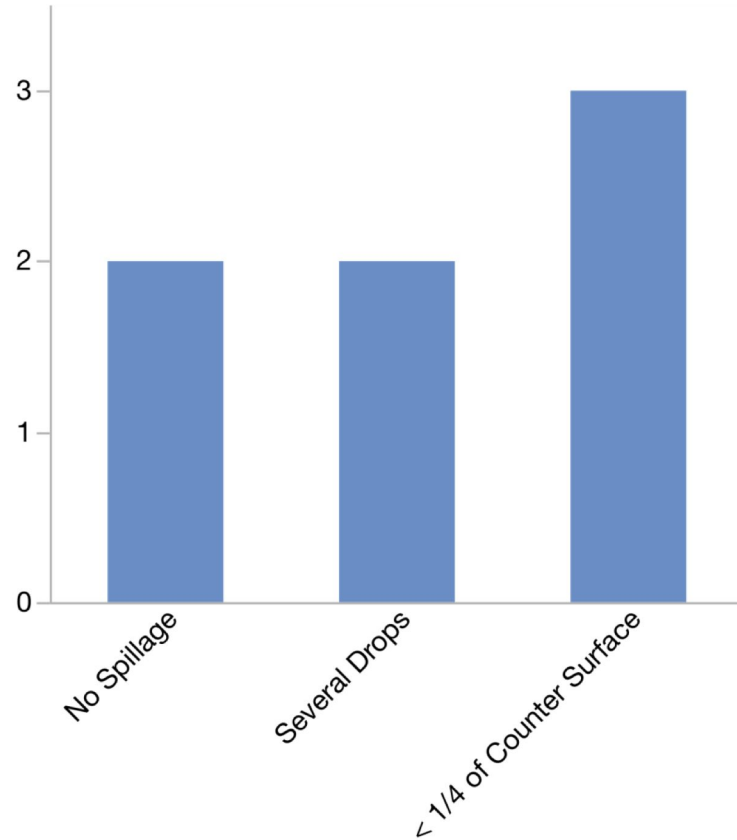
Task completion: $t(5) = 2.21$, $p = .039$, one-tailed.

	With Instructions	Without Instructions
Time to read instructions	20 s	
Time to complete tasks	64.2 s	108.7 s
Total:	84.2 s	108.7 s

Results: Satisfaction and SUS

	ASQ (satisfaction)		SUS (overall usability)	
Instruction	Mean	SD	Mean	SD
No	2.33	0.88	77.50	9.01
Yes	2.83	0.88	60.63	25.85

Results: Messiness



Counter Messiness

Participant Feedback

1. Learnability of the high pressure water sprayer
 - a. Not intuitive to use
2. Sanitation
3. Theft Concerns
4. Possible additional features:
 - a. Hand rinsing faucet
 - b. Water bottle filling faucet
5. Instruction sheet

Conclusion

- The device has good usability
- The instruction sheet was helpful for most participants for task completion time and effectiveness

Recommendations

1. Include English written instructions underneath the visual diagrams.
2. Fixate the sprayer so that it's not rotatable
3. Add cleaning tools such as paper towel dispenser or soap