RLP-AIDB · RLP AI Design B — Case Studies, Prototypes, Patents and Capstone

Unit 1: AI in the Clinic: Case Studies from Past to Present

Practice Workbook. The same problems, in the same order, as the Practice sections of the online lessons.

Name _____ Period _____

Lesson 1.1 — Posters, Press Releases and Proof: How Health Technology Is Sold

FLUENCY

1. Describe the design of the WPA health posters (1936-1943) in three features, and say what they were made to do.

2. Define *independent validation*, *deployment* and *persuasive design*.

3. Name the three kinds of claim the lesson says to separate for every case.

APPLICATION

4. Sort these retinopathy items into developer claim, independent study, or real deployment, and explain the twist: (a) Google's 2016 JAMA paper on grading retinal photographs; (b) the 2020 Beede study of Google's system in Thai clinics.

5. Build a two-column claim-and-evidence chart with three rows for IBM Watson for Oncology, using only facts from the lesson.

6. Compare the visual language of a WPA health poster with the visual language the lesson describes for AI health products today. Name one similarity and one difference.

7. An invented AI eye-screening product page says: '97% accurate. Trusted by clinics.' Write two questions you would ask to check it, using the lesson's three kinds of claim.

REVIEW

8. Review (Semester A, Unit 2): The FDA authorized IDx-DR in 2018. What did the FDA describe as first about it, and is it the same system as Google's 2016 JAMA system?

Lesson 1.2 — Storyboarding a Talk: Sticky Notes, Props and the Stage

FLUENCY

1. Define *robot-assisted surgery*, *autonomous surgical robot* and *myoelectric prosthesis*.
2. What did the FDA clear the da Vinci system for in 2000, and what three things does the robot do for the surgeon?
3. Name the three rows of the sticky-note storyboard and the job of each.

APPLICATION

4. Compare body-powered and myoelectric prosthetic arms: how is each controlled, and where does machine learning enter?

5. A headline says: 'Robot performs surgery on its own at local hospital,' about a da Vinci procedure. What is wrong, and what did the 2022 STAR report actually show?

6. Your two-minute rehearsal covers 12 sticky notes. If each note gets equal time, how many seconds is that per note? If you add a 20-second prop moment and keep the total at two minutes, how many seconds are left for each of the 12 notes?

7. Describe a handmade prop that would make AR navigation clear, and say what the sound-off test would show about it.

REVIEW

8. Review 1.1: In your talk, a slide says 'AR makes surgery safer.' Which of the three kinds of claim is this, and what would you need before saying it?

Lesson 1.3 — Talking to Machines: A Structured Written Debate on Mental Health Chatbots

FLUENCY

1. Define the *ELIZA effect* and explain why the lesson says it is stronger today.

2. Define *large language model* and *engagement design*.

3. Name the three criteria the lesson uses to critique a chatbot interface, and the question each asks.

APPLICATION

4. List four design choices the lesson says chatbot designers make that can increase trust, and three features that human-centered design would include.

5. Critique this invented interface, 'Pip', on safety routes: the 988 number appears only on the fourth screen of the settings menu, and the home screen shows a smiling avatar and the line 'I'm always here for you.' Give a rating, evidence and one change.

6. Restate the proposition's strongest point in words its holders would accept, then write a one-sentence rebuttal from the opposition, using a fact from the lesson.

7. Why does the lesson say research on chatbot apps must be read carefully? Name two cautions it gives.

REVIEW

8. Review (Semester A, Unit 4): Why can a free wellness app's conversations be outside HIPAA? Use the term *covered entity*.

Lesson 1.4 — Radiology, Prediction and Telemedicine: Writing the Talk

FLUENCY

1. Define *predictive analytics*, *alert fatigue*, *precision medicine* and *telemedicine*.

2. List the six parts of the talk spine in order.

3. The lesson says to say exactly what a radiology tool does. Name the four roles it lists.

APPLICATION

4. The 2021 Michigan study found the sepsis model identified only about a third of sepsis cases. In an invented hospital with 300 sepsis cases, about how many would it identify and miss? What lesson does the case teach?

5. KFF Health News reported an estimated 660,000 Mercy virtual visits during the pandemic, after 'a couple hundred' in 2019. Taking 200 as the 2019 figure, how many times larger is 660,000? What design rule does the lesson give for showing this number on a slide?

6. Turn this vague redesign into a specific one: 'The telemedicine service should be fairer.' Use the lesson's warning about telemedicine.

7. Write the first two rows of a two-column script for a talk on the retinopathy case: what you say and what the audience sees.

8. Why does the lesson connect personalised medicine back to bias? Name the program it mentions.

REVIEW

9. Review 1.3: Your podcast version of the talk has no slides. What must the companion visual do, according to 1.4, and which 1.2 rehearsal test checks the voice alone?

Unit 1 checkpoint

1. Which feature is typical of the WPA health posters?
   A. Long paragraphs of small text
   B. Flat bold color, one image and a short command in large type
   C. Photographs of scans
   D. Glowing overlays and percentages
2. True or false: A study by a developer's own researchers counts as independent validation.
3. In Thai clinics, many retinal images taken in poor lighting were rejected by the system as _____.
4. What happened to IBM's Watson Health data and analytics business in 2022?
   A. It won FDA authorization
   B. IBM sold it
   C. It merged with MD Anderson
   D. It became open source

5. Which surgical system decides and performs steps itself?
   A. da Vinci
   B. STAR, in research on pigs
   C. A body-powered prosthesis
   D. An AR navigation system
6. True or false: The sound-off test checks whether the visuals carry the story without the voice.
7. The tendency to attribute understanding to a program that produces human-like text is called the _____ effect.
8. Which design change most improves a mental health chatbot's safety routes?
   A. A friendlier avatar
   B. More emoji
   C. A visible route to a human and to 988 on every screen
   D. Faster typing indicators
9. Frequent alerts, many of them false, that lead staff to ignore warnings cause:
   A. Overfitting
   B. Alert fatigue
   C. The ELIZA effect
   D. Deployment
10. True or false: 'Make the AI better' is a specific redesign proposal.
11. In 2015 Mercy opened its Virtual Care Center in Chesterfield, Missouri, which its officials called a hospital without _____.

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