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# Examining Digital Problem Solving Skills in Libraries to Promote Digital Equity

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# EXAMINING DIGITAL PROBLEM SOLVING SKILLS IN LIBRARIES TO PROMOTE DIGITAL EQUITY

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In Collaboration with Multnomah County Library, Portland, OR, USA

And Consultant, Stephen Reder, Portland State University

# THIS WORK IS SUPPORTED BY


*Advancing Digital Equity in Public Libraries: Assessing Library Patrons' Problem Solving in Technology Rich Environments* (NATIONAL LEADERSHIP GRANT-06-14-0076)

# EDUCATION AND SKILLS ONLINE

The Online version of the Survey of Adult Skills (PIAAC)
A joint initiative of the OECD and the European Union

- **Education & Skills Online** is an assessment tool designed to provide individual-level results that are linked to the OECD Survey of Adult Skills (PIAAC).
- Institutions, organisations or local governments can use the online tool to assess the skills of a particular population with the goal of providing training or for research purposes.

# WHY ARE PST-RE DATA RELEVANT FOR LIBRARIES?

Libraries of all types…

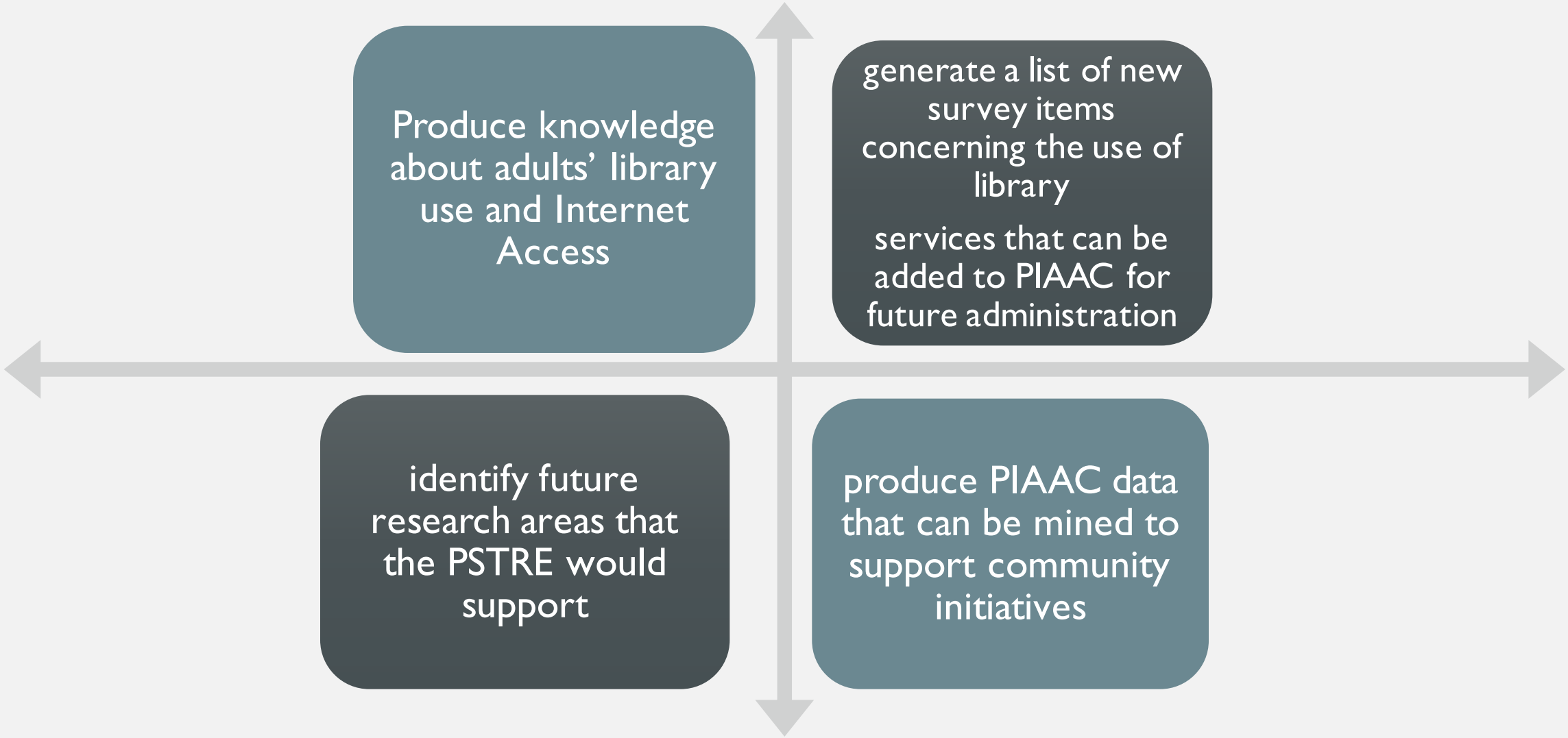
Support interest-driven lifelong learning

Provide hubs for Internet access and digital literacy training

Deliver content & services using technology

Include libraries in workforce development through the use of the PIAAC

# PIAAC'S BACKGROUND QUESTIONNAIRE DOESN'T INCLUDE ANY QUESTIONS ABOUT LIBRARY USE



# PURPOSE OF THIS RESEARCH

Extend national work on digital literacy acquisition to inform local efforts

PIAAC

Programme for the International Assessment of Adult Competencies

Bring libraries into the PIAAC conversation

Maximize resources and meet community needs around lifelong learning and access

Problem solving in technology rich environments

PS-TRE

Using digital technology, communication tools and networks to **acquire and evaluate information, communicate** with others and **perform practical tasks**

in 3 domains

Personal, Workplace, Civic

# ADMINISTERED EDUCATION AND SKILLS ONLINE N=195

**Who did we sample?**

- Face-to-face in Library Branches
- Face-to-face Library Outreach Community
- Distributed Link using the Library's newsletter

**What were the data sources?**

- Researcher designed survey focused on online access and library use
- PS-TRE assessment from Education and Skills Online

**How did we learn about individual approaches to digital problem solving?**

- Screen recording
- Verbal Protocol Analysis

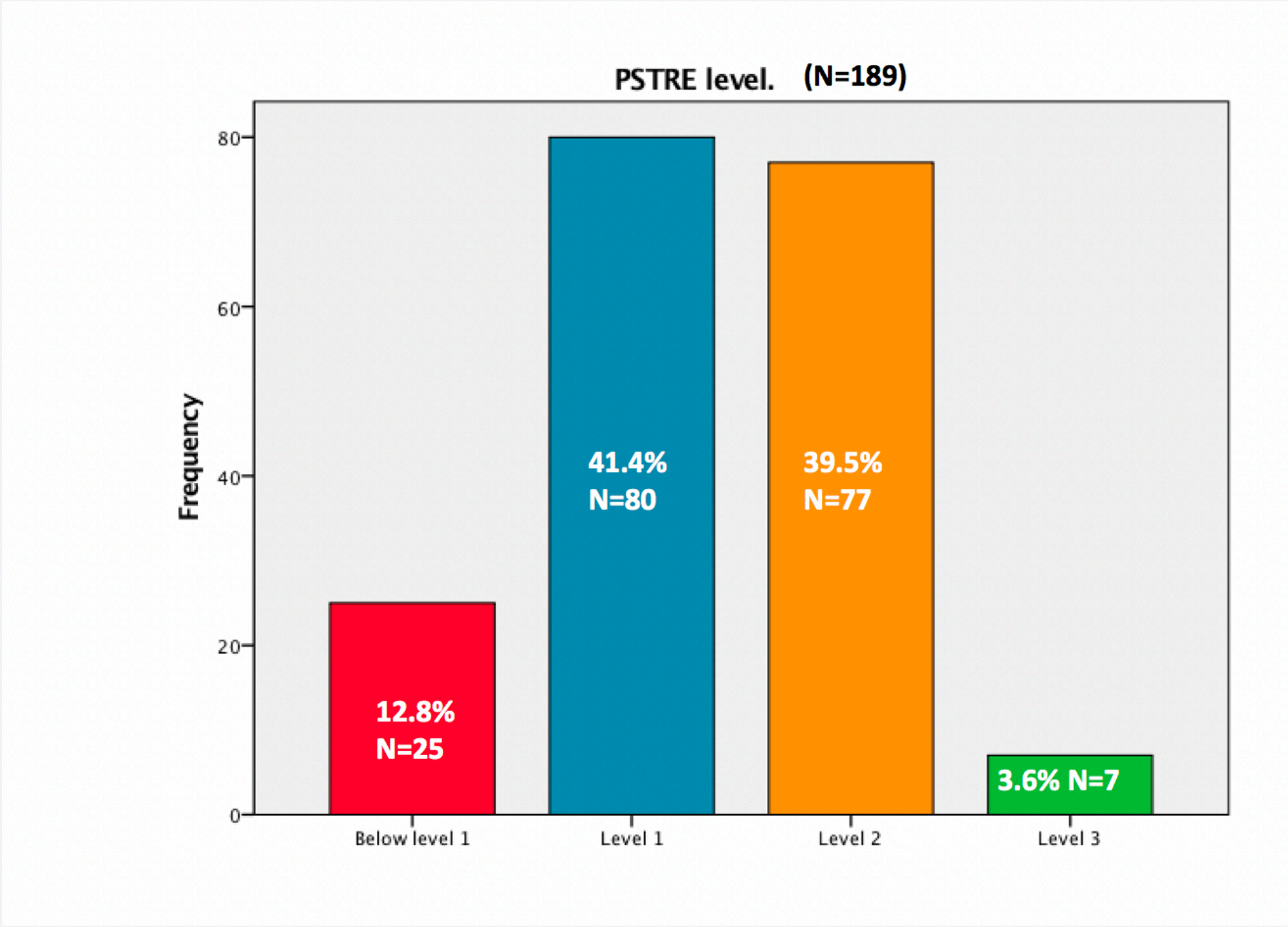
# KEY LIBRARY SURVEY VARIABLES

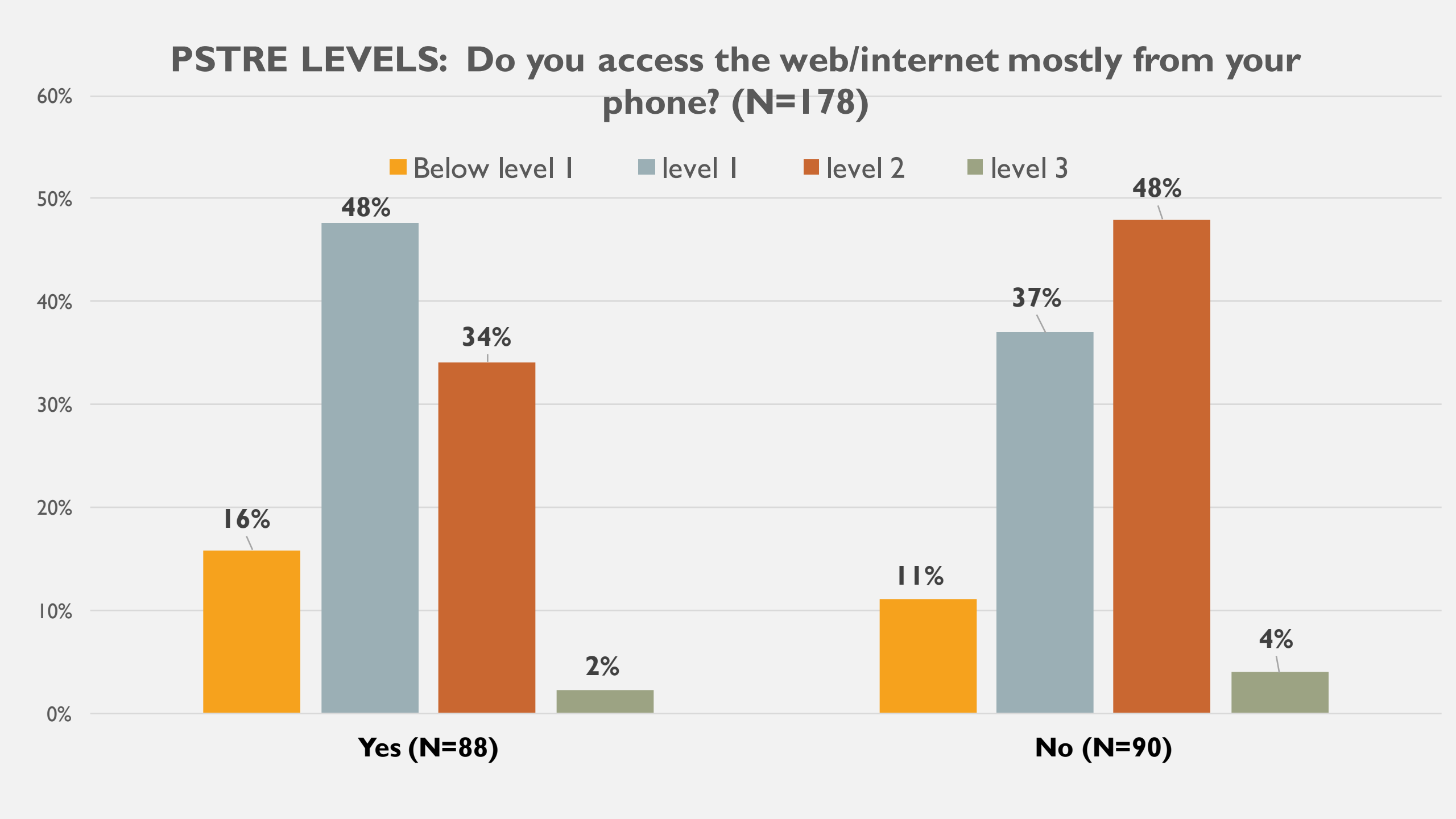
**Desired Skills**: Participant perception of whether they have the skills they need to accomplish their goals.

**Self-efficacy:** Participant perception of whether they are able to accomplish their goals.

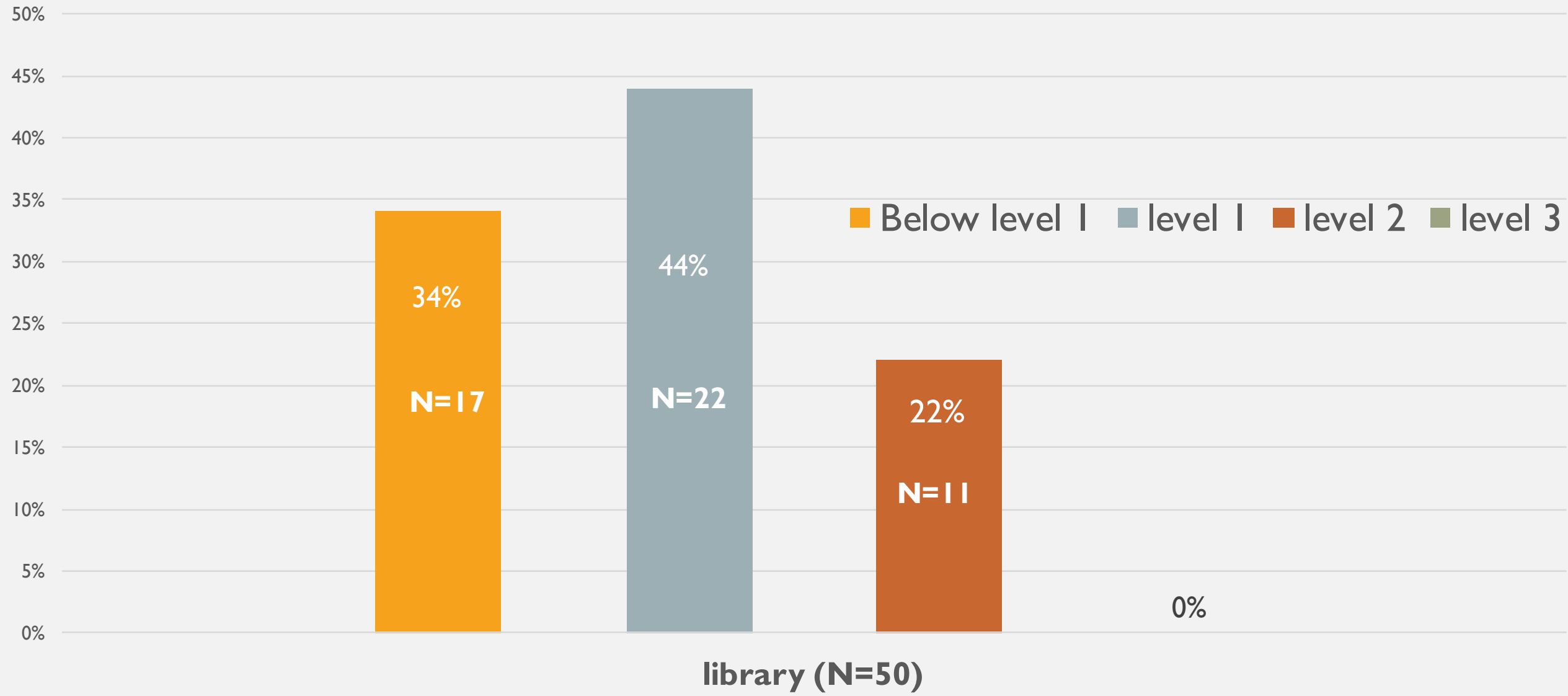
**Library Website Use:** Set of questions about ease of library website use

# WHAT DO THE PST-RE DATA COLLECTED FROM LIBRARY USERS SUGGEST?

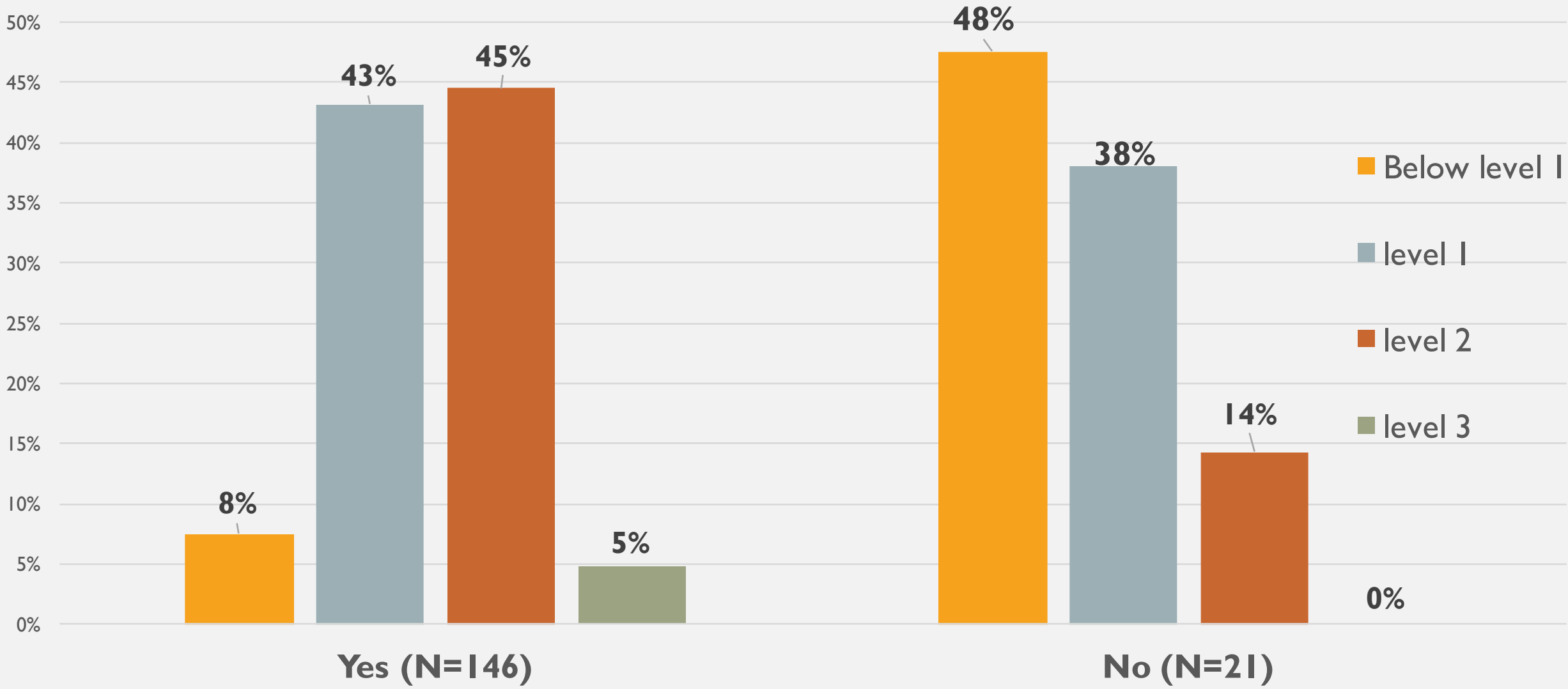

PSTRE level. (N=189)
Frequency
80
60
40
20
0
41.4%
N=80
39.5%
N=77
12.8%
N=25
3.6% N=7
Below level 1
Level 1
Level 2
Level 3


PSTRE LEVELS: Do you access the web/internet mostly from your phone? (N=178)
60%
50%
40%
30%
20%
10%
0%
Below level 1
level 1
level 2
level 3
16%
48%
34%
2%
11%
37%
48%
4%
Yes (N=88)
No (N=90)

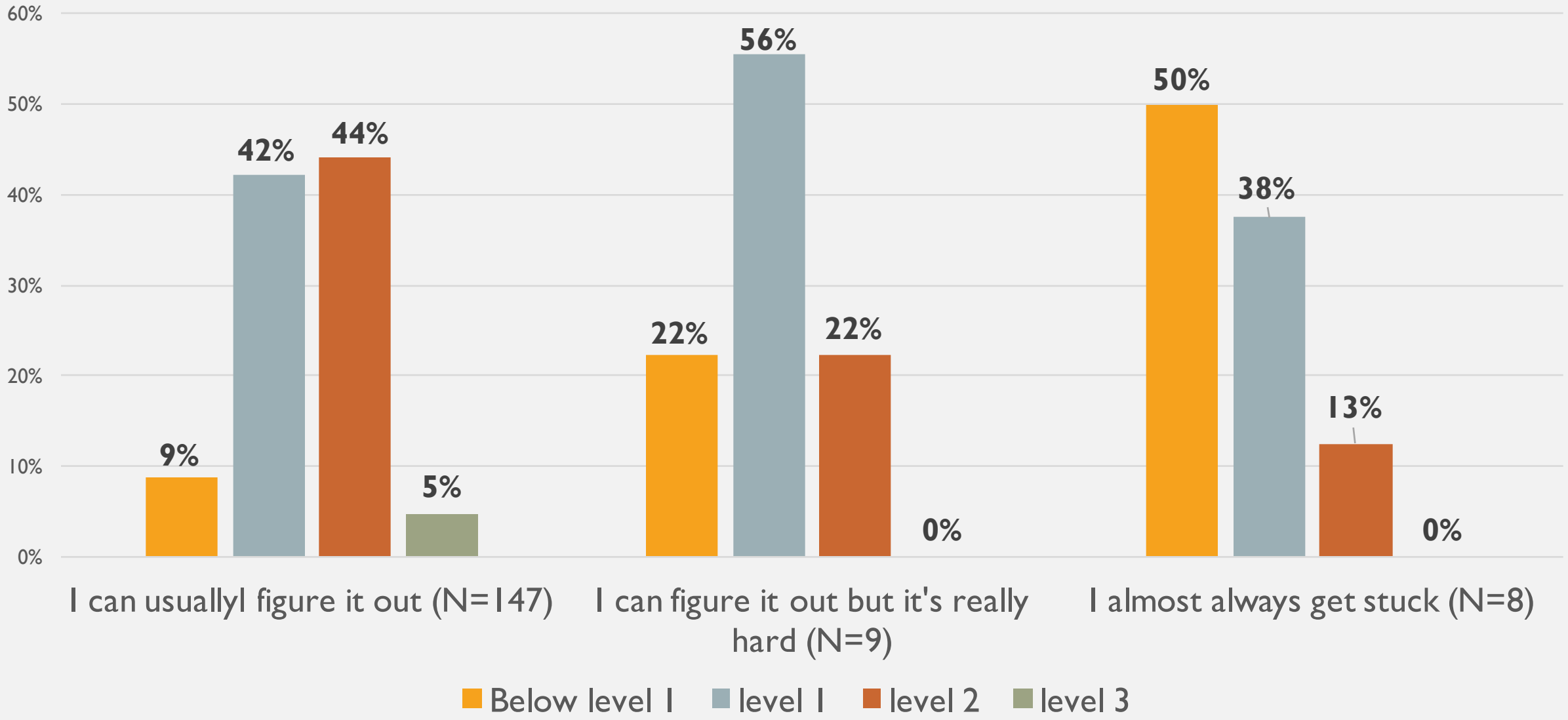
# PSTRE levels: People who access web/internet mostly from library (N=50)



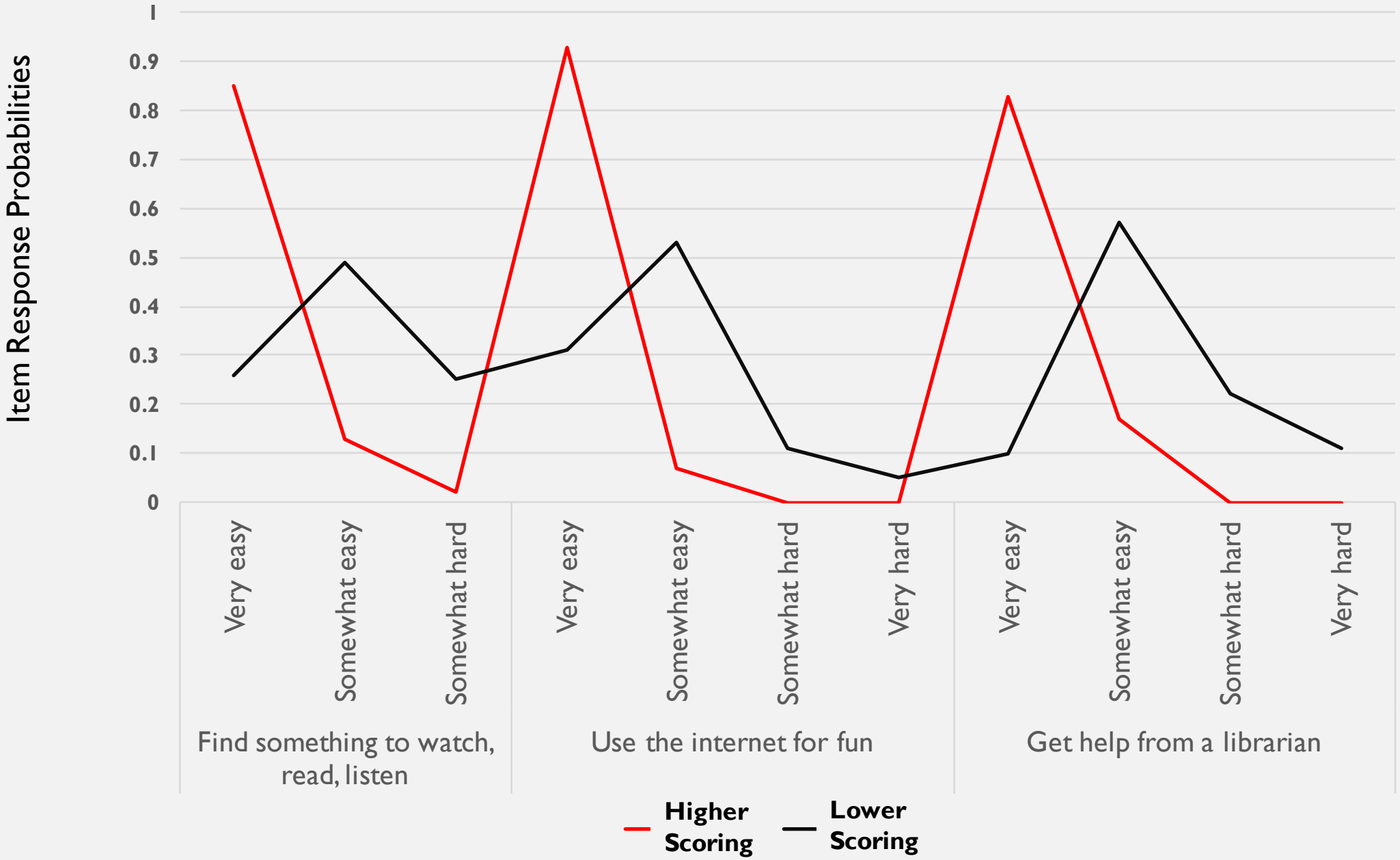
# Desired Skills: Do you have the skills to do what you need or want to do online? (N=167)



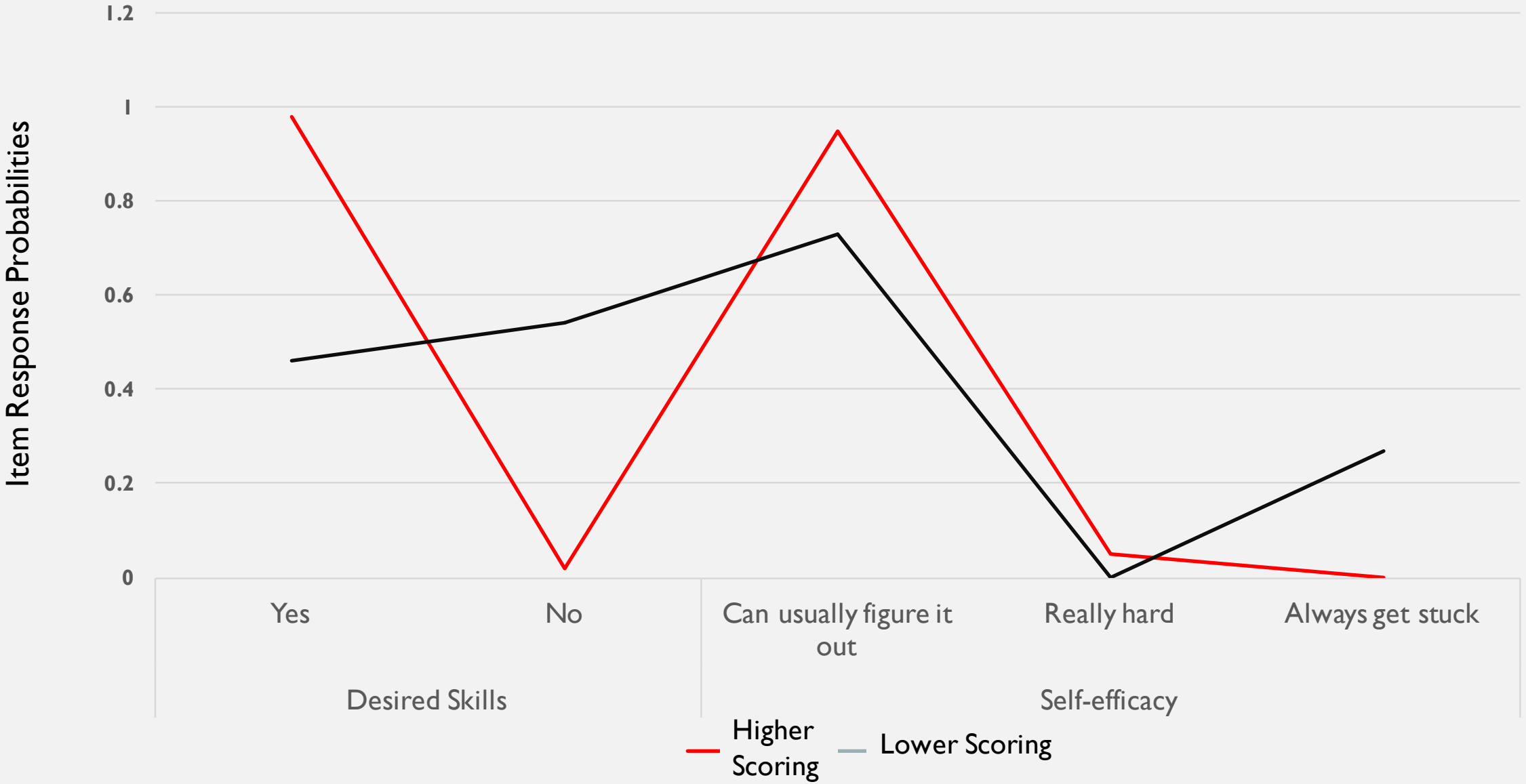
# Self Efficacy: When I'm trying to do something online… (n=164)



# Group Differences: Library Website Use



# Group Differences: Self-Efficacy



# CONDITIONAL ITEM RESPONSE PROBABILITIES

| Items | Desired Skills | | Self-efficacy | | | Find something to watch, read, listen | | |
|---|---|---|---|---|---|---|---|---|
| Class | Yes | No | Can usually figure it out | Really hard | Always get stuck | Very easy | Somewhat easy | Somewhat hard |
| Higher scoring | .98 | .02 | .95 | .05 | .0 | .85 | .13 | .02 |
| Lower scoring | .46 | .54 | .73 | .0 | .27 | .26 | .49 | .25 |
| | | | | | | | | |
| Items | Use the internet for fun | | | | Get help from a librarian | | | |
| Class | Very easy | Somewhat easy | Somewhat hard | Very hard | Very easy | Somewhat easy | Somewhat hard | Very hard |
| Higher scoring | .93 | .07 | .0 | .0 | .83 | .17 | .0 | .0 |
| Lower scoring | .31 | .53 | .11 | .05 | .10 | .57 | .22 | .11 |

# OBSERVATIONS OF DIGITAL PROBLEM SOLVING: LIBRARY TASKS

# FRAMEWORK: DIMENSIONS OF DIGITAL PROBLEM SOLVING

| PSTRE Cognitive Dimension | Example |
|---|---|
| Goal Setting and Progress Monitoring | Identifying needs, Detecting and interpreting unexpected events impasses or breakdowns |
| Planning and Self-Organizing | Setting up plans, procedures, and strategies<br>Selecting resources and categories |
| Acquiring and Evaluating Information | Selecting Information, Assessing Reliability, Reasoning about Sources and Contexts |
| Making Use of Information | Organizing Information, Transforming Information, Communicating with relevant parties |

# DEVELOPMENT OF LIBRARY TASKS ALIGNED WITH PSTRE FRAMEWORK

**Goal Setting and Progress Monitoring**

**Planning and Self-Organizing**

**Varying Levels of Complexity**

**Acquiring and Evaluating Information**

**Making Use of Information**

Find the Overdrive book My Beloved World By Sonia Sotomayor. Check it out and read it On your desktop

Find a resume help session that at a time and Location convenient to you.

Find a volunteer opportunity at the library for someone who likes to play chess and wants to work with the public. What is the minimum age for that volunteer to be eligible?

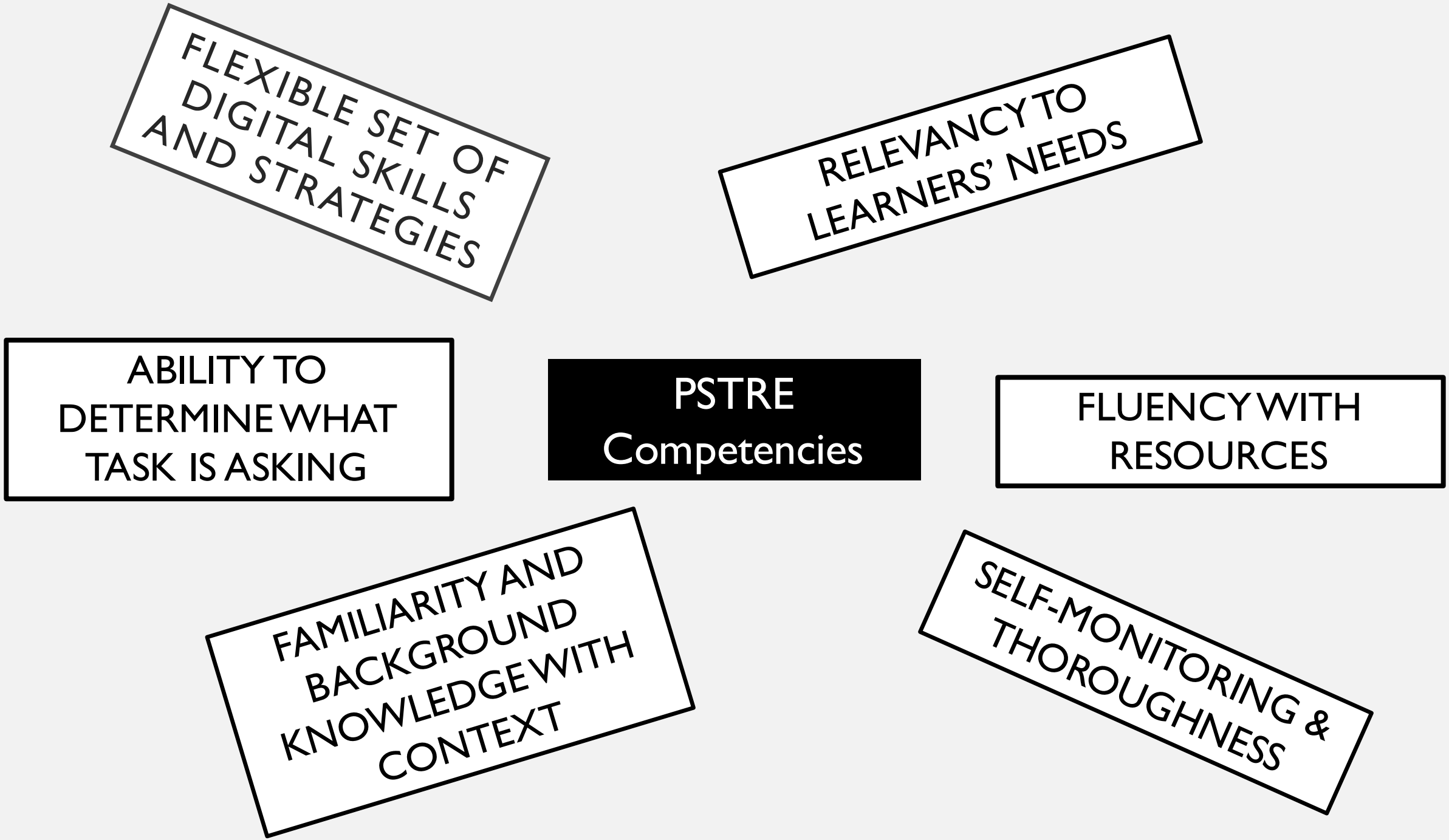
Find a librarian who can give you reading suggestions on true crime. Ask that librarian for a reading recommendation.

Go to the Medline Plus database and find the symptoms of Zika Virus.

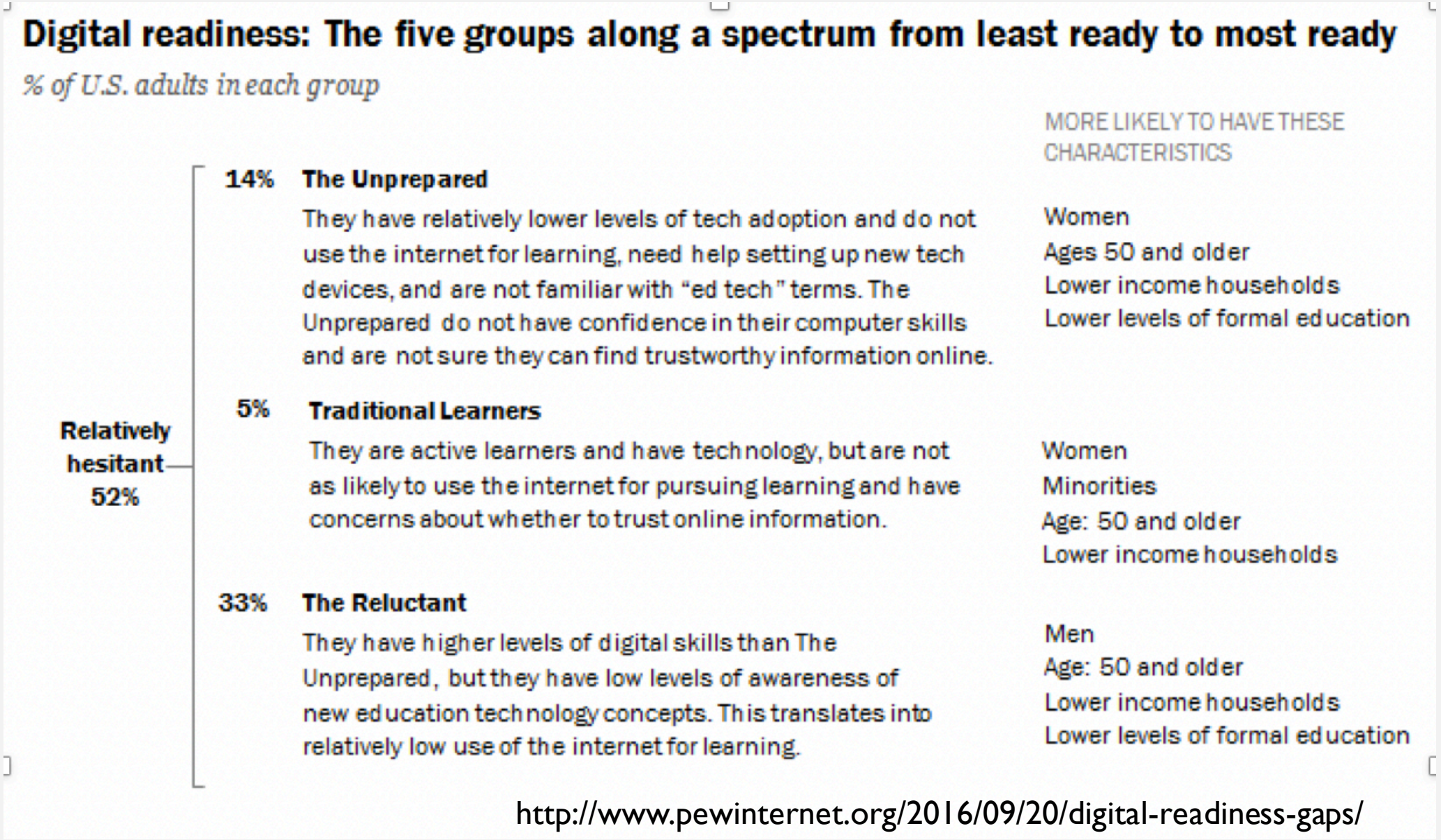
# OBSERVATIONAL PROTOCOL

| Levels of Independence | Gives Up | Aided Prolonged | Partial Independence | Independent, Straightforward |
|---|---|---|---|---|
| Goal setting & Progress monitoring |  | | | |
| Planning/Self-Organizing |  | | | |
| Acquiring & Evaluating information |  | | | |
| Making use of information |  | | | |
| Genre Knowledge |  | | | |

# A COMPLEX MODEL OF DIGITAL PROBLEM SOLVING

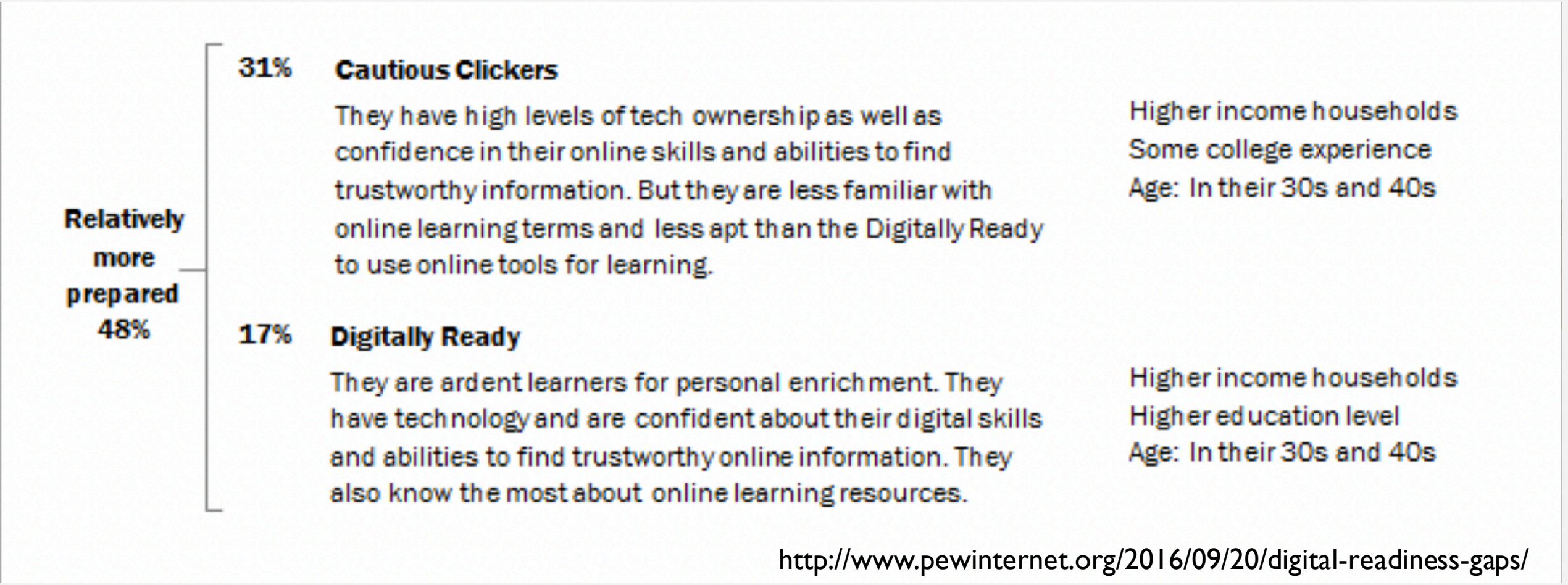

FLEXIBLE SET OF DIGITAL SKILLS AND STRATEGIES
RELEVANCY TO LEARNERS' NEEDS
ABILITY TO DETERMINE WHAT TASK IS ASKING
PSTRE Competencies
FLUENCY WITH RESOURCES
FAMILIARITY AND BACKGROUND KNOWLEDGE WITH CONTEXT
SELF-MONITORING & THOROUGHNESS

# Pew Research Center




http://www.pewinternet.org/2016/09/20/digital-readiness-gaps/

# Pew Research Center

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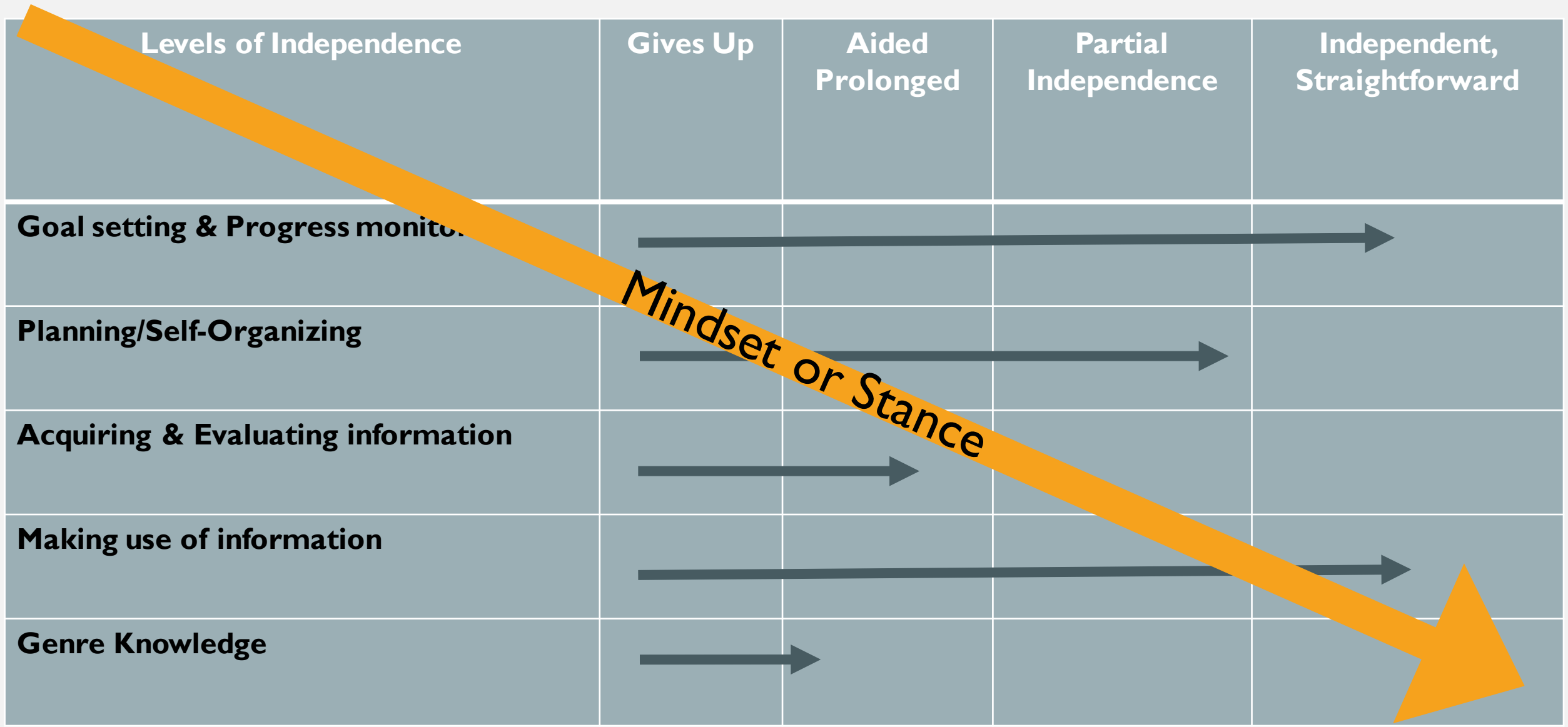
# OBSERVATIONAL PROTOCOL

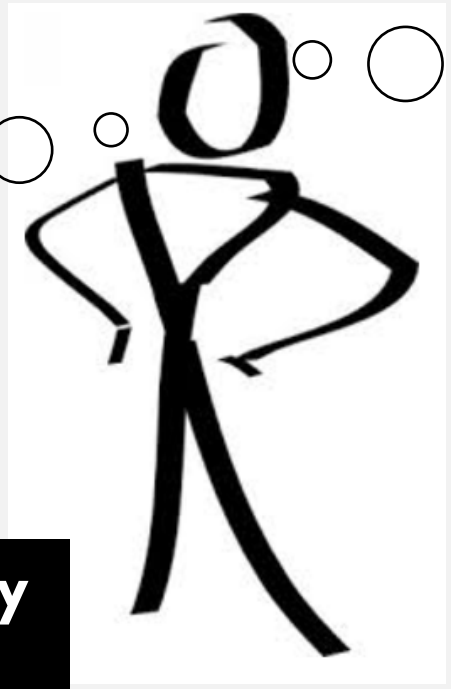


There might be a better way to do this, but I'm sticking with what I know works. I'll keep trying , but will need help if what I know doesn't help.

**The Schematic Mindset**

I'm going to go step-by-step to figure this out. I'll need help if I run into something I haven't seen before.

**The Procedural Mindset**



I'm going to look at all the different tools available and pick the one that seems to be the best. I might need to be reminded of how to do something if I get lost in my exploration.

**The Exploratory Mindset**

What I did back there and the resources I used can help me with what I'm trying to do here. I can use the same resources and process.

**The Learn from Experience Mindset**

# CONCLUSIONS

- **Digital Problem Solving is complex** and multi-dimensional – to explore the full range, we need to look at both **scores and observations**
- **PSTRE Competencies are fluid** and cut across task, use of resources, and contexts
- **Mindsets and stances also shift** across tasks and contexts; within individuals
- Comparisons can be made across **PSTRE and library tasks**
- **Levels of Support** provide a means of scaffolding both competencies and mindsets

# DIGITAL LITERACY ACQUISITION AND EQUITY RESEARCH HUB

DLAERHUB.WORDPRESS.COM

## CONTACT INFORMATION

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**Thank you for your attention**