Designing Surveys in SoTL: Guidelines and Considerations

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Welcome!

Before the Session	During the Session	After the Session
Let us know if our **audio** and **screen** are sharing	**Turn off your mic** until the Q&A	Complete the **feedback survey** (link via email)
Download the **slide deck** from the chat	Share your questions and comments in the **chat**	Review the **session slides** when posted

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Land Acknowledgement

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

—Revised by the Elders' Circle (Council of Indigenous Initiatives)

Acknowledgement

We would like to acknowledge the contributions of both past and current CTSI colleagues—Gregory Hum, Kyle Turner, Clarissa Lau, and Cora McCloy—in developing the content for an earlier **Survey Design** workshop in 2022. The content of this workshop has been adapted from that work.

Access Check

We understand access to be a shared responsibility between everyone in this space. We will strive to create an accessible space that reduces the need for you to disclose a disability or impairment for the purposes of gaining an accommodation. In doing this together, we strive to welcome disability, and the changes it brings, into our space.

Is there anything about the virtual space (display, sound, speaking speed, etc.) that we should address now?

Are there any other access needs that might affect your participation in the conversations that we could also address?

Outcomes of Today's Workshop

By the end of this session, you will be able to:

- Identify research questions that can be answered with surveys
- Identify types of surveys, and variables which can be assessed with surveys
- Make informed choices on the use of appropriate survey instruments
- Design effective survey questions
- Disseminate surveys and collect data

Agenda

1. **Introduction**: SoTL Overview & What is a survey
2. **Survey Research**: When and how to use them
3. **Survey Questions**: Choosing what to ask
4. **Designing Questions**: Design considerations
5. **Practical Advice**: Obtaining Responses
6. **Reviewing & Selecting a Survey**
7. **Resources**

Connections: Poll and chat activities & Breakout Room Activities

In the Poll:

- What is your current level of comfort with designing surveys?

  5 = Very High
  4 = High
  3 = Moderate
  2 = Low
  1 = Very low

Introduction

SoTL Overview

What is a survey (and what isn't it)?

How does my SoTL research journey begin?

*"The heart of scholarship of teaching and learning is a cycle of inquiry... **start with something that matters to you and make it matter to us**. ...This is usually where scholars of teaching and learning begin, with **questions that matter to our pedagogy**."*

Gale, R. (2009). Asking questions that matter… Asking questions of value. *International Journal for the Scholarship of Teaching and Learning*, *3*(2), 3. https://doi.org/10.20429/ijsotl.2009.030203

What is a survey?

- A tool/method where participants respond to multiple questions
  - Can be delivered in a variety of ways
  - Questions can be of a variety of formats

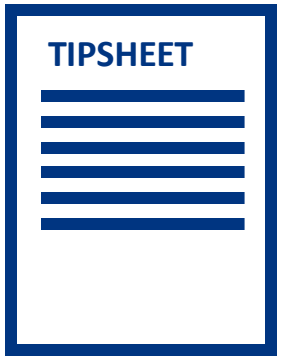
- Often sent to a large number of participants

- Not being covered: Tests with right or wrong answers
  - Ability tests
  - Concept inventories
  - Standardized tests

Key terms

- Survey/form/instrument/questionnaire
- Question/item
- Participant/respondent/student
- Questionnaire scale (multiple items)
- Rating scale (multiple response options)

See our resource tipsheet as a reference



In the chat

What do you hope to learn from this session?

Survey Research

When and how to use surveys

Effective Use of Surveys

- Surveys are good for collecting constrained, self-reported information on a large scale
  - **Who** are my students? (e.g., demographics, past experience/knowledge, motivation)
  - **What** was students' experience of...?
  - **What** do my students need or want?

- Surveys tend to seek to describe what is average or most common within or between groups

Survey Designs

One time survey

- Typically towards the end of a course

Pre-post surveys

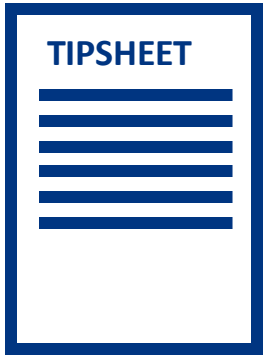
- Considers whether changes can be reasonably detected

Post-pre survey

- Towards end but asks about what earlier responses would have been

Multiple surveys

- Change over multiple time points (longitudinal)



Questions that surveys are not good at

Detailed narratives

- Interviews

Objective information (e.g., realized outcomes, purely objective quantities)

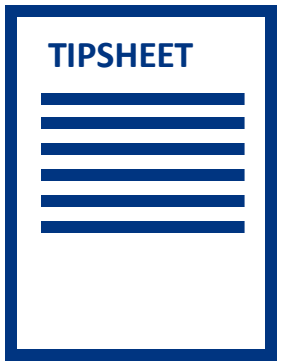
- Observations
- Metrics

Long retrospectives

- Diaries
- Documents

Surveys as complementary methods

- Survey then interview/focus group – provides greater depth
- Interview/focus group then survey – provides greater breadth
- Supplement with class metrics (e.g., attendance, standardized testing, grades)



Pros and Cons of Surveys

Pros

- Highly flexible
- Quantitative and/or qualitative data
- Collect data from large groups

Cons

- Often requires some prior knowledge of potential responses
- Self-report
- Shallow snapshot in time (often one-off)
- Difficult to select, design, and/or analyze

Poll & Chat Activity

- Which is better suited to a survey?
  - How often are students using a new discussion tool, and do they like it?
  - How do students use the discussion tool, and how does their use lead to different interactions with classmates?

For the less suitable option, what data collection method(s) would be appropriate?

Option A or B?

- **Option A: "How often are students using a new discussion tool, and do they like it?"**

  ✅ Best suited for a survey because:

self-reported usage frequency /student perceptions /identify trends

- **Option B: "How do students use the discussion tool, and how does their use lead to different interactions with classmates?"**

  ❌ Less suited for a survey because:

rich, detailed narratives/in-depth exploration/social dynamics and patterns of use

Survey Questions

Choosing what to ask

Consider the outcome when selecting questions

- How will the results inform my teaching?
- How likely will I find the results I want? Do I need to collect other data?
- Is there strong alignment between the questions, evidence gathered, and claims made?

Types of common questions

1) Demographic/grouping variables

2) Measured variables

- Scales (not to be confused with the term rating scale): Multiple questions/measured-variables which together intend to measure a latent construct

3) Open response

- Not all-inclusive or mutually exclusive

Variables

Survey questions often represent variables

Example variables:

- Agreement with a statement
- Rating of an attitude
- Online versus face-to-face group
- Year of study
- Grades

Some things we can do with surveys

Surveys are used to explore what is common within or between groups

- Describe grouping and measured variables
  - % of students from a given major
  - Average perceived workload of course
- Compare groups on measured variables
  - class attendance between elective vs. non-elective
- Relate measured variables with each other
  - satisfaction with an online course and comfort with technology

Grouping/demographic variables

- Frequently qualitative or numeric
- Used often to describe or group respondents for later comparison
  - e.g., year of study, instructional method, major
- Typically, relatively straightforward to construct
- Statistically, often independent or predictor variables

Measured variables

- Typically ordinal options and/or numbers
  - e.g., rating attitude on 1-5 scale, strongly agree=5 to strongly disagree=1
- Can be more challenging to word (e.g., expected grade vs. attitude)
- Statistically, are often (though not always) dependent or predicted variables

Scales

- Validated instruments are often comprised of scales
- Multiple related items (i.e., measured variables) together can form a questionnaire scale
- A questionnaire can have multiple scales
- Scale items often scored as composites (rather than each item's score individually)

Latent factors/constructs/scales

"A construct is a concept used by social scientists … to conceptualize unobservable or unmeasurable elements of a domain of study to formulate a theory…."

The SAGE Encyclopedia of Social Science Research Methods (2004)

Some constructs surveys can *try* to measure

Attitudes

Beliefs

Opinions

Perceptions

Self-efficacy

- These are often not easily measured with single items
- *Having multiple items improves reliability, in part by accessing all facets of an* ***underlying construct***

Open response

- Typically qualitative, can be numeric
- Responses can vary widely in length
- Allows emergent, possibly deeper responses
- Interpreting the data can be challenging (e.g., age [11, eleven, Eleven, Elven])
    - If possible, it is preferable to limit these

Breakout Room Activity

Choose from the following two options:

Option 1: someone in your group shares an overview of their SoTL project and the survey items they have developed.

Option 2: Use this scenario to have a group discussion

You piloted an optional interactive online lab demonstration tool and are interested in how this has affected students' ability to work in the lab as opposed to those who did not do the lab demonstration.

Breakout Room Activity

For either **Option 1** or **Option 2, discuss the following questions** in your breakout group:

1) What are some questions you could ask/have asked to collect **grouping variables**?
2) What are some questions you could ask/have asked to collect **measured/response variables**?
3) What are some **open response** questions you could ask/have asked?

5-min Break

Designing Questions

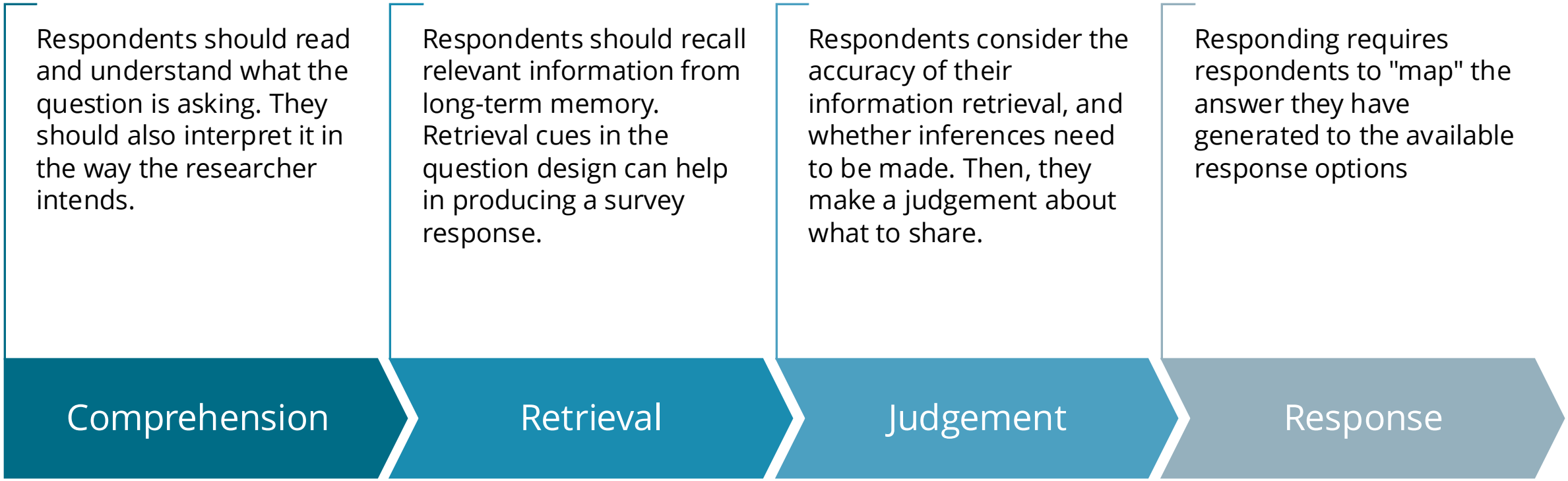
Things to consider

Cognitive Aspects of Survey Methodology (CASM)

- Involves the intersection of cognitive psychology and survey methods to better understand:
  - The cognitive processes involved with answering survey questions
  - How survey design can be used to support the collection of better-quality answers and/or more representative answers

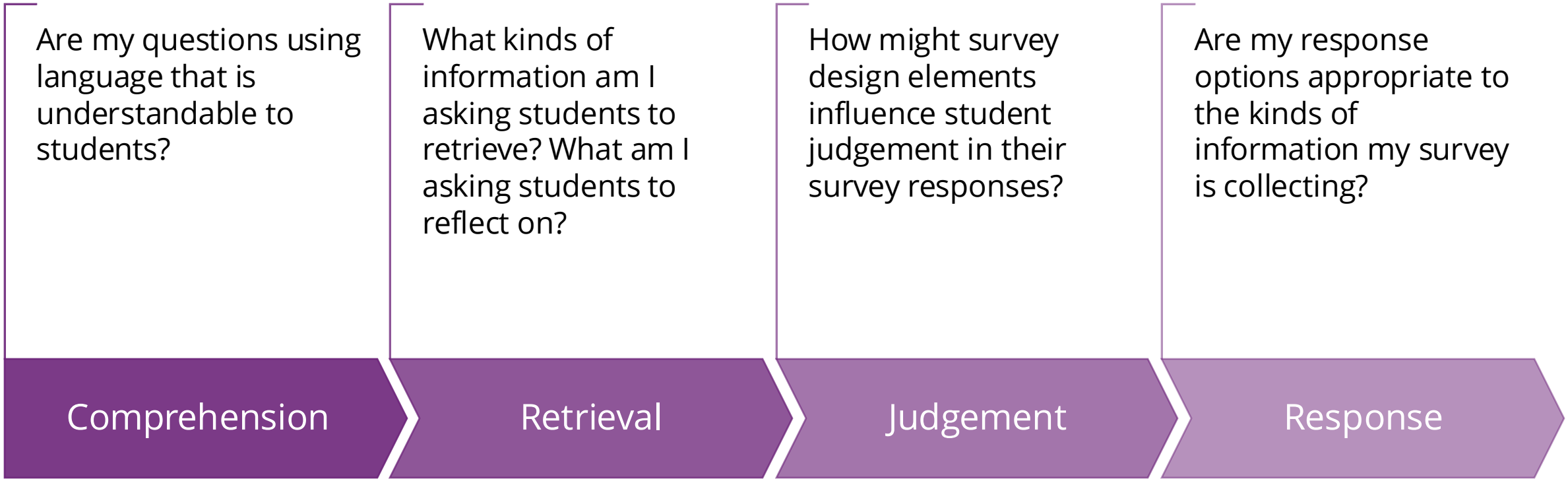
(Robinson and Leonard, 2019)

The Psychology of Survey Response



(Tourangeau, Rips, & Rasinski, 2000)

Thinking about how students respond



(Tourangeau, Rips, & Rasinski, 2000)

Consider different cognitive biases

- **Satisficing:** when respondents provide minimally acceptable answers instead of ones that are representative of what is being researched
  - Choosing the mid-point response, the don't know option. Etc.
  - This can be mitigated by reducing ambiguity in the questions, response options, and in reducing survey fatigue
- **Social Desirability Bias:** when respondents self-edit their answers to conform to social norms, "look good", or avoid consequences of being honest
  - In SoTL, the power-dynamics between instructors and students can affect their responses in teaching and learning surveys

Good survey questions…

- Are relevant to your research
- Are specific and clearly written
- Considers recall/respondent effort

Good survey questions are relevant to your research

Research question: "How do first-year university biology students perceive the impact of a flipped classroom model on their **engagement, conceptual understanding**, and **overall learning experience**?"

Relevant Survey question:

- The pre-class materials (e.g., videos, readings) helped me better understand biological concepts.

Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree

Good survey questions are relevant to your research

Research question: "How do first-year university biology students perceive the impact of a flipped classroom model on their **engagement, conceptual understanding**, and **overall learning experience**?"

Irrelevant survey question:

- "I find that what I learn in other courses helps me in my learning for this course."

Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree

Good survey questions are specific and clearly written

- Use appropriate and straightforward vocabulary (provide definitions)

Poorly worded survey question	Clearly worded survey question
"In this biology course, the implementation of the flipped classroom pedagogical paradigm, which emphasizes student-centered active learning, significantly improved my cognitive engagement and facilitated metacognitive self-regulation." **Response Options:** (Strongly Agree, Agree, Don't Know, Disagree, Strongly Disagree)	"The flipped classroom approach (where I watched videos before class and did activities during class time) helped me better understand and remember biology concepts." **Response Options:** (Strongly Agree, Agree, Don't Know, Disagree, Strongly Disagree)

Good survey questions are specific and clearly written

Double-barreled: Survey questions that ask two or more things at a time.

"Rate your enjoyment of the **online discussions** and **quizzes**".

- How does a student respond if they enjoyed the online discussions but not the quizzes?
- Creates ambiguity in response interpretation

Good survey questions are specific and clearly written

Leading questions: survey questions that lead respondent's judgement and influence their response.

"Don't you agree that the *innovative* flipped classroom approach *significantly enhanced* your learning experience in biology compared to *outdated* traditional lectures?"

- The language is loaded, and biases respondents towards a positive view of the flipped classroom approach.

Considers recall/respondent effort

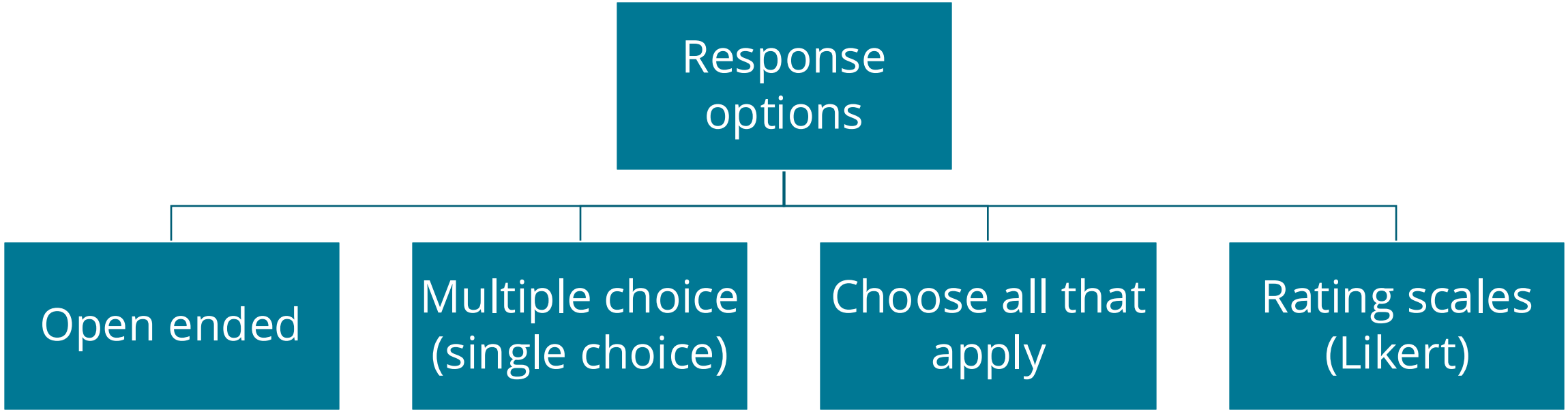
What information are students being asked to retrieve?

How often did the TA ask questions [insert listed time frame]?

- In this tutorial (easiest recall)
- In this week
- In this month
- In this term (most difficult recall)

It would be difficult for students recall how often the TA asked questions in the term.

Considerations for response options



Likert Scale Questions

Survey question

"Working in a group improved my communication skills."

Response scale options

- 1 = strongly disagree
- 2 = disagree
- 3 = neither agree nor disagree
- 4 = agree
- 5 = strongly agree

Good rating response options

Balance variability with discrimination

- 5 or 7 is ideal
  - Can you distinguish between 14 and 15 vs. 13 and 14?
- 4 or 6 “forced choice”; no middle option may get “guessing”

Use numbers and qualitative anchors for all points

- 1=strongly disagree… 5=strongly agree…
- Keep wordings ‘evenly spaced’, balanced, and non-overlapping
  - e.g., Age: 1-4, 4-6, 7-15 (poor)

Question order

- Beginning with “easy” questions may make a survey seem shorter and “easier” to complete
- Question order can affect responses.
  - Consider if a course with low course averages is first asked what grade they anticipate they will get, then they are asked if they like the course next

- Remember to keep the survey short overall
- **Survey Fatigue:** Respondents tend to tire over time and responses may get less meaningful over time—keep this in mind for positioning difficult questions

Chat Activity

What issues do you see with this survey question and how can we improve it?

Do you find math and science difficult?

a) Yes

b) No

Chat Activity

What issues do you see with this survey question and how can we improve it?

Do you find math and science difficult?

a) Yes

b) No

What is your level of confidence in math?

5 = Very High

4 = High

3 = Moderate

2 = Low

1 = Very low

Chat Activity

What issues do you see with this survey question and how can we improve it?

How would you score your probability of persisting in this discipline?

- 5 = Very likely
- 4 = Highly likely
- 3 = Quite likely
- 2 = Somewhat likely
- 1 = Quite unlikely

Chat Activity

What issues do you see with this survey question and how can we improve it?

How would you score your probability of persisting in this discipline?

- 5 = Very likely
- 4 = Highly likely
- 3 = Quite likely
- 2 = Somewhat likely
- 1 = Quite unlikely

How likely are you to continue in this program?

- 5 = Very likely
- 4 = Moderately likely
- 3 = Neither likely nor unlikely
- 2 = Moderately unlikely
- 1 = Very unlikely

Breakout Room Activity

- Option 1: Please review the questions you shared in the previous breakout session. To apply what we shared in this session, are there any changes you would make to enhance the design of the survey questions?

- Option 2: Please revisit the collaborative document your group developed in the previous breakout session. To apply what we shared in this session, are there any changes you would make to enhance the design of the survey questions?

- Please choose a spokesperson to report back.

Report back

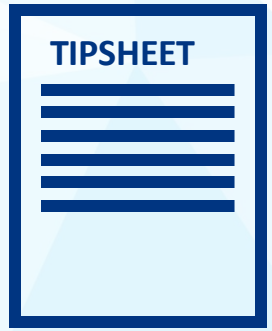
Please feel free to share the questions you discussed and developed as a group. You can either unmute or use the MS Teams chat. Explain any edits to wording and response options that you discussed. Feel free to share any roadblocks that you experienced in your discussions.

Thinking Through Option 2

- What are some questions you could ask to collect **grouping variables?**
  - Saw/didn't see an interactive lab demo
  - Previous experience with labs/no experience
  - In major/out of major
- What are some questions you could ask to collect **measured/response variables**?
  - Confidence in the lab
  - Expected grade
  - Time to complete task
- What are some **open response** questions you could ask?
  - What parts of the interactive online lab demo were useful?
  - If you did not watch the lab demonstration, why did you choose not to?

Practical Advice

How to recruit and engage students?



Ethics and Consent with Survey Research

- Begin with consent and purpose of survey
  - Indicate how long the survey will take
  - Explain confidentiality/anonymity procedures
  - Explain data storage
  - Benefits/incentives are stated
  - Other risks are explained (if applicable)

- If consent is needed, make this the first question

Survey Sampling Strategies

Probability Sampling

- **Simple random sampling:** randomly select students to be in your sample; everyone has a random change of being selected
- **Stratified random sampling:** You randomly select students within different strata; e.g. selecting students within business, arts, humanities, and sciences, so that there is no over representation from one discipline

Survey Sampling Strategies

Non-Probability Sampling

- **Convenience sampling:** selecting students who are easily accessible; a department surveying their work-study students
- **Purposeful sampling:** selecting students who dropped the course to understand how to better support their course retention

Survey invitations

Timing

- One time/pre-post/post-pre/multiple
- Don’t send invitations too early
- Avoid sending with other institutional surveys

Consider ethics

- Doing a face-to-face invitation might be coercive (have a colleague or TA do this)

Promoting the survey

- Low response rates (e.g., 20%) are common
- Most responses will come within 2-3 days of an invitation or reminder
- Send short e-mail reminders to improve response rates
- Low response rates may be difficult to interpret
- Things to consider:
  - incentivizing students
  - Their workload at different points of the term

Response Rate for Reliability and Precision

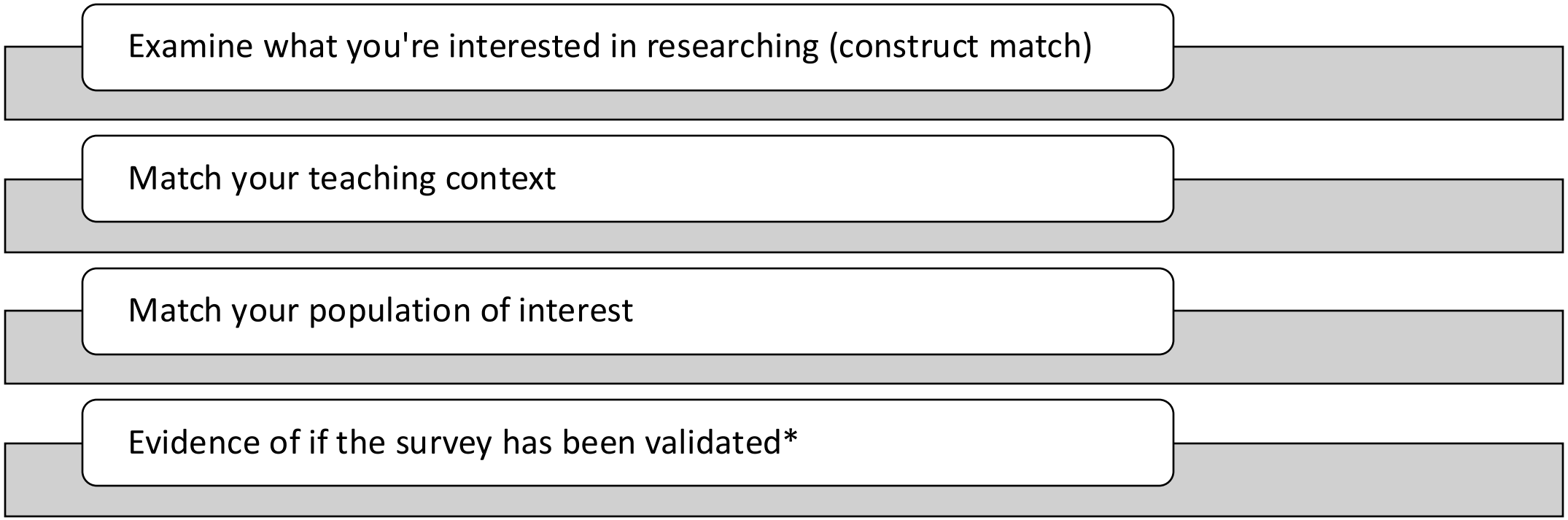
Course Size	Response Thresholds
Very Small (1-25 students)	Receive a response rate of 70% or higher **and** at least 14 completed surveys.
Small (26-50 students)	Receive a response rate of 50% or higher **and** at least 14 completed surveys.
Medium (51-100 students)	Receive a response rate of 40% or higher **and** at least 15 completed surveys.
Large (101-200 students)	Receive a response rate of 20% or higher **and** at least 15 completed surveys.
Very Large (201+ students)	Receive a response rate of 10% or higher **and** at least 18 completed surveys.

Source: A Step-by-Step Guide to Reviewing Course Evaluations

Reviewing & Selecting a Survey

Assessing Validated Instruments

- Look for survey tools in the SoTL literature that:



Reviewing a Survey: Response Processes

Response Processes Validity: a way to assess how well people understand and respond to survey questions (Hubley, 2021)

- Is there alignment between what the respondent interprets and what was meant to be measured?
- Are the response categories appropriately capturing the range of expected responses?

This helps us to understand the meaning from our survey scores

Reviewing a Survey: Response Processes

- Get feedback from students, subject matter experts, teaching colleagues
- Cognitive interview/think-aloud (e.g., with students)
  - What does the question mean to you?
  - What are you thinking as you consider a response?
  - Why did you select this response?
- Pilot
  - Get respondent feedback on survey itself with extra questions
  - How long does the survey take?

Resources

U of T Survey tools

- Microsoft Forms [Office 365]
- Quercus (anonymity not guaranteed)
- REDcap
- Others such as Qualtrics (subscription fee required)

SAGE Surveys

The SAGE Handbook of Survey Methodology

http://methods.sagepub.com/book/the-sage-handbook-of-survey-methodology

*Ch. 16: Designing Questions & Questionnaires

The SAGE Encyclopedia of Social Science Research Methods

https://methods.sagepub.com/reference/the-sage-encyclopedia-of-social-science-research-methods

References & Resources

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Other SoTL Support

- Upcoming webinars
- SoTL Quercus Hub (enrol here),
  - Resources
  - Discussion Boards
  - Webinar Materials

In the Poll:

- What is your current level of comfort with designing surveys?

  5 = Very High
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  1 = Very low

Chat Activity

Share one lesson you're taking away from this session.

Q&A

Thank you!