



Instructor's Guide to Growth Mindset

Laboratory implementation, theoretical foundations,
experimental evidence, and variants

Behavioral and Experimental Economics Research Lab
Department of Economics



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<https://beer-lab.org/>

How to use this guide

This guide accompanies the BEER Lab growth mindset family. It is intended for economics and social science instructors teaching how to measure beliefs about intelligence malleability, score statements with different directions, and distinguish a self-report from educational outcomes. Basic editions administer the published three-item form distributed by SPARQ; extended editions administer the six-item form from the Dweck and Blackwell research tradition. Each participant answers one form once.

The operational route explains access, rooms, instructions, comprehension, omission, closing and reporting. The conceptual route develops differences among beliefs, capability and learning, then introduces formulas, missing information and report interpretation. Twenty-two worked cases support preparation without prior familiarity with the measure. Figures are genuine captures from the local instance using synthetic participants.

Both forms retain their own wording and keys. English preserves published content; Spanish is a BEER Lab teaching translation without psychometric validation. Materials retain attribution and class access controls. No result is an intelligence performance score, diagnosis or demonstration that an intervention caused learning. Use this guide to formulate questions answerable with the information actually collected, and to identify additional evidence required for stronger conclusions about behavior or educational achievement.

Author

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For the instructor

Rehearse with synthetic data, confirm language and edition, and close the access-code panel before projection. Preserve each form and its anchor direction; distinguish original answers from scoring. State N and missing-data rules before interpreting differences.

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The activity and its administration

Purpose	Measure beliefs about intelligence malleability and teach self-report scoring.
Experimental unit	Person; individual activity without matching or waiting.
Basic edition	Published three-item SPARQ/Dweck form, administered once.
Extended edition	Published six-item Dweck/Blackwell form, without administering the basic form beforehand.
Decision	Choose among six agreement levels; explicit omission.
Outcome	Complete mean from 1 to 6, higher incremental orientation; item-level review. No payments or intelligence performance measure.
Topics	growth mindset; implicit theories of intelligence; malleability; learning; belief measurement
JEL	A22, C83, C91, I21, D84
Participants	Any positive count; one person per interface.
Suggested duration	Basic: 2-3 minutes; extended: 3-5; class: 50-75. Planning estimates, no automatic time limit.

<https://beer-lab.org/>

<https://teaching.beer-lab.org/>

https://growthmindset.beer-lab.org/room/growthmindset_en

<http://localhost:9172/demo>

1.1 What is administered and what students can learn

Basic editions administer three entity statements; extended editions administer six, three entity and three incremental. Each person answers only their session's form. There are no partners, waits, demographic questions, endowments or payments. The objective is to teach belief measurement and distinguish it from performance or an intervention to change habits. The interface does not present hypotheses before answering. Reports identify instrument and translation so the later discussion can reconstruct exactly what was administered.

1.2 Institutional navigation and room selection

Begin at the BEER Lab website and select Classroom to reach the games catalog. The growth mindset card identifies the family, its topics and its editions. Proposed rooms are `growthmindset_es` for basic Spanish, `growthmindset_en` for basic English, `growthmindset_extendidido` for extended Spanish and `growthmindset_extended` for extended English. Within this family's instance, Demo should contain four configurations and Rooms four rooms. Each room offers one configuration in the corresponding language and edition. If another family appears or a selector is empty, stop distributing links and request an instance check before starting the cohort.

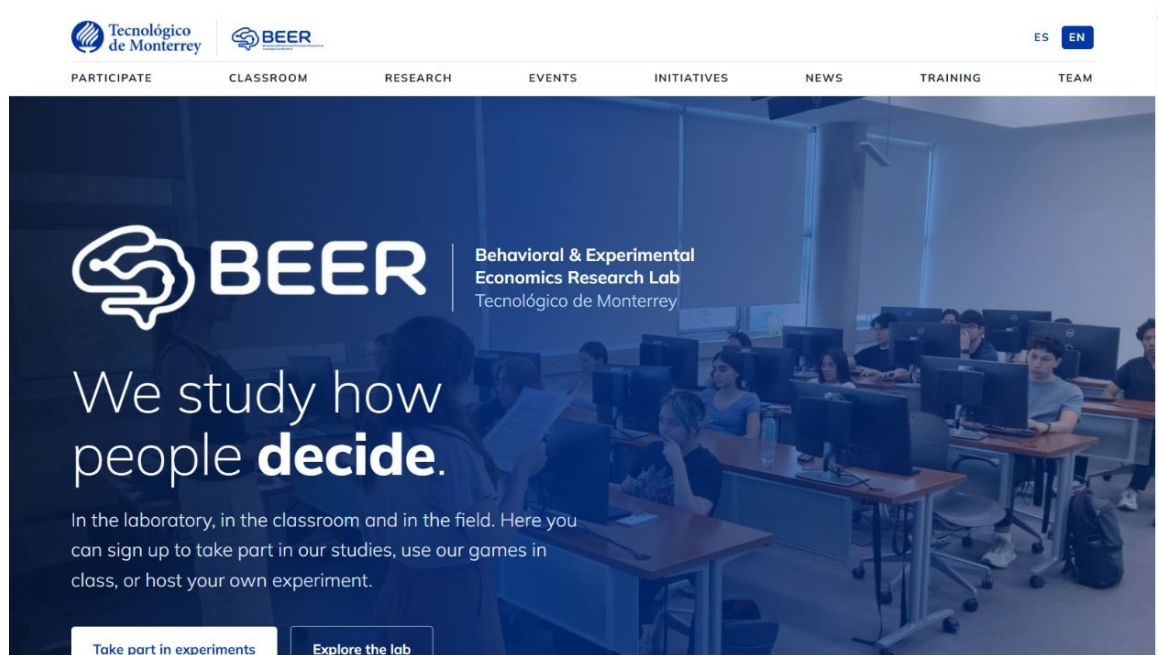


Figure 1.1: Select Classroom to reach the teaching activity catalog.

The verified delivery preview runs on localhost, port 9172, and can be accessed from the same computer. It is not an address for students using other devices. Addresses under `growthmindset.beer-lab.org` are the intended deployment routes. A room is a shared entry point, an individual link refers to a position in a session, and a report is an authenticated instructor page. Confusing these addresses can send students to administration or cause two people to use the same position. Distribute the entry route appropriate to the teaching procedure and retain administrative links for staff.

1.3 Creating a session and managing its access

Sign into the instructor panel using the institutional credentials supplied by the laboratory. Do not share those credentials with students. Demo supports rehearsals with synthetic responses; use a separate session and stable rooms for the class. Any positive participant count is admissible because the task is individual. Three people can complete it without waiting for a fourth. Confirm the session size, selected configuration and cohort before distributing individual links. Keep rehearsal sessions separate from classroom data, and avoid interpreting an old demonstration as if it described the current group.

Each session generates a questionnaire access code, available in a collapsed report panel. Share it with the cohort and close that panel before projection. This code differs from the administrative password and technical session code. An incorrect entry produces an explanation and allows

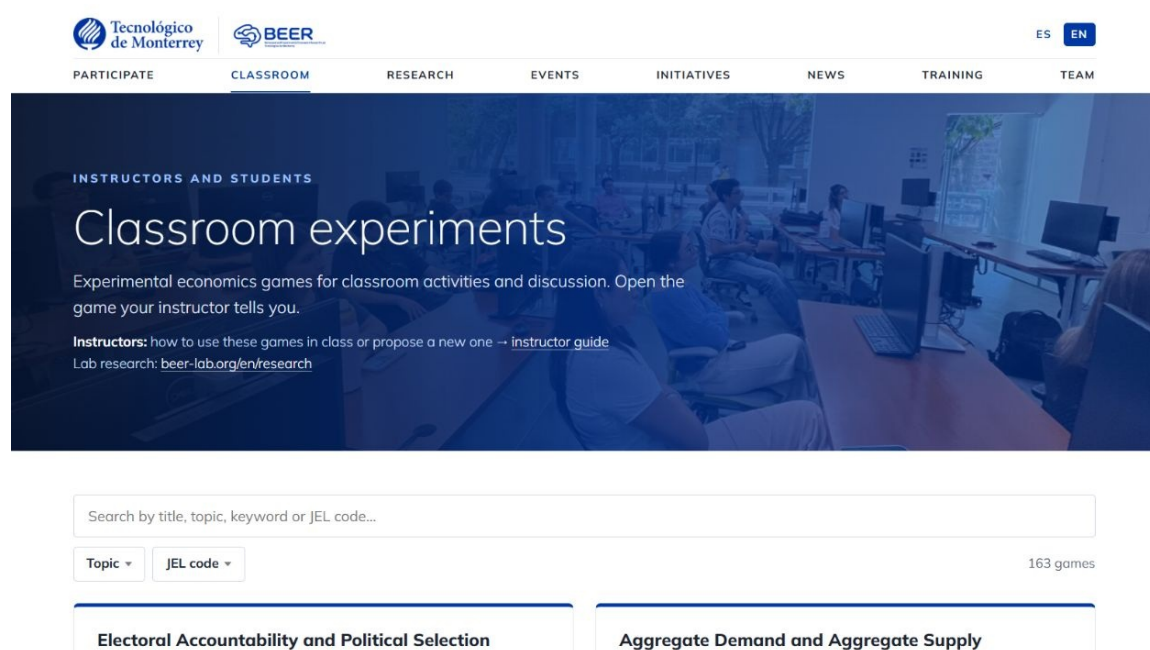


Figure 1.2: Review the catalog; the new card appears after deployment.

Rooms

Current rooms:

Mentalidad de crecimiento · Español · básica
Growth mindset · English · basic
Mentalidad de crecimiento · Español · extendida
Growth mindset · English · extended

Figure 1.3: Select language and edition among this family's four rooms.

Room: Growth mindset · English · basic

Create a new session

Session Config

Growth mindset · 3 statements · basic ▾

Number of participants

Individual decisions: any positive participant count is allowed.

Create

[Configure session](#) ⚙️

App sequence

growthmindset_assessment (6 rounds)

Published three- and six-item forms; source-specific scoring and explicit Spanish teaching translation.

0 participants present

Start links

These URLs will stay constant for new sessions, even if the database is recreated.

Room-wide URL

Here is the room-wide URL anyone can use. Don't use this link when testing in multiple tabs on the same browser, because all tabs will be assigned to the same participant, using a cookie.

http://localhost:9172/room/growthmindset_en

Figure 1.4: Check that the basic English room selects only its configuration.

Demo

Mentalidad de crecimiento · 3 afirmaciones · básica
Growth mindset · 3 statements · basic
Mentalidad de crecimiento · 6 afirmaciones · extendida
Growth mindset · 6 statements · extended

Mentalidad de crecimiento / Growth Mindset — BEER Lab

Selecione una variante de este juego. Select a version of this game.

Figure 1.5: Choose among four configurations; extended editions add the six-item form.

Mentalidad de crecimiento · 3 afirmaciones · básica: session 'qr0bcrla'

[Edit](#) [Links](#) [Monitor](#) [Data](#) [Payments](#) [Report](#) [Description](#)

You can either use the session-wide link, persistent links, or single-use links.

Session-wide link
If it's not practical for you to use a Room, you can distribute the following link to participants.

<http://localhost:9172/join/simogehe>

Persistent links
For a real session, you should use a [room](#).

Single-use links
Below are single-use links.

P1	http://localhost:9172/InitializeParticipant/codkegeh
P2	http://localhost:9172/InitializeParticipant/cd3u89bn
P3	http://localhost:9172/InitializeParticipant/xb1hmuil

Figure 1.6: Assign one link per person and keep synthetic rehearsals separate.

correction; a successful entry is erased from its response field before proceeding. The gate restricts entry to the academic activity, but does not make screenshots or individual links suitable for unrestricted circulation. All demonstration positions shown in this guide are synthetic. The access procedure should remain an operational detail rather than a source of pressure to disclose personal responses.

1.4 Welcome, instructions and comprehension

Instructions present six agreement options from strongly agree to strongly disagree. There is no neutral category; a separate option allows omission. Comprehension asks what to do when disagreeing with a statement. The appropriate answer expresses one's own view or omission; an error receives explanation and retains the selected option. This is not a knowledge test and does not determine how the questionnaire should be answered. Resolve control questions without directing opinions.

1.5 Completion, participation and score availability

Basic editions close after three statements. The application has six technical periods but automatically skips the remaining three and displays closing in period six. Extended editions close after six statements without administering basic first. There is no before-and-after comparison or synchronization with others. An explicit closing confirms recording. Basic editions provide no individual profile; extended private feedback depends on instructor disclosure.

Completion means every screen in the form was submitted, including omissions. Score availability means every substantive answer was supplied. These conditions can differ. If someone omits a statement, completion is recorded but the mean is missing. Available responses still appear in item-level review. Keep those questions separate during progress checks and do not interpret omission as strong disagreement.



Individual questionnaire

The Behavioral and Experimental Economics Research Lab in the Department of Economics at Tecnológico de Monterrey is a place to learn about economic decision making through controlled activities.

Participation rules

- Work individually and privately.
- Remain silent and do not discuss your responses with others.
- Follow the instructions on each screen.
- Do not refresh or close the page while responding.
- If you need help, raise your hand or contact staff privately.

Responses are private. The instructor may show aggregate results after choosing to reveal them. Individual profiles will not be projected.

Access code provided by the instructor

☐ I have read the rules and wish to start.

Start

Figure 1.7: The welcome explains participation rules without suggesting a desirable profile.

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Instructions

Read each sentence below and choose the one number that shows how much you agree with it. There are no right or wrong answers.

Indicate how much you agree with each statement according to your own opinion. There are six options: 1 is strongly agree and 6 is strongly disagree. There is no neutral option; if you do not wish to answer, select explicit omission. Answers do not determine an academic grade or generate payments.

This is an individual activity. There are no partners, endowments or payments linked to responses. You may indicate that you prefer not to answer an item.

Responses are private. The instructor may show aggregate results after choosing to reveal them. Individual profiles will not be projected.

6 statements.

Continue

Figure 1.8: Explain scale, statement count, omission and the absence of payments.

BEER Lab

Before you start

If you disagree with a statement, what should you do?

- ☐ Choose the option reflecting your opinion or indicate that you prefer not to answer
- ☒ Choose what you think the instructor wants to read

Your answer: Choose what you think the instructor wants to read. The correct answer is Choose the option reflecting your opinion or indicate that you prefer not to answer. Respond according to your own opinion. You may disagree or omit a statement; do not choose what you imagine the instructor expects.

Continue

Figure 1.9: Comprehension feedback retains the choice and explains its correction.

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Statement 1 of 6

How much do you agree with this statement?

You have a certain amount of intelligence, and you really can't do much to change it.

Your response

☐ Strongly agree☐ Agree☐ Mostly agree☐ Mostly disagree☐ Disagree☐ Strongly disagree☐ I prefer not to answer**Confirm response**

Figure 1.10: Answer one statement per page or use explicit omission.

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Activity complete

Your responses have been recorded. Keep this screen open and wait for the instructor's directions.

If private feedback is enabled, it will appear here after the instructor reveals the results.

Figure 1.11: Completion confirms recording; configured feedback requires instructor disclosure.

Beliefs about intelligence and learning

2.1 The construct and its measurement question

Growth mindset denotes the belief that intelligence can develop. In this tradition, an entity theory emphasizes stability and an incremental theory emphasizes malleability. Theory does not mean the participant has developed a scientific explanation; it names an expectation that may influence interpretations of difficulty. The questionnaire records agreement with statements about intelligence. Its immediate object is those beliefs, rather than a reasoning examination, memory task or observation of effort. This definition sets the boundaries of the report before any association with grades or choices is discussed. A descriptive score should retain that limited meaning.

Two students receive the same low result. One infers a stable limit; another considers changing strategy. This illustrates interpretations without establishing different capabilities or subsequent learning. Testing that relationship requires behavior, opportunity and outcome measures. This activity records questionnaire answers only. Distinguish observed answers, proposed mechanisms and evidence needed to test them when discussing investment and incentives.

Belief in malleability does not mean everyone reaches any outcome equally easily. Learning requires conditions, time, help and strategies; failure cannot simply be attributed to insufficient determination. In human-capital production, beliefs may influence investment alongside budget constraints, teaching quality and expected returns. The questionnaire neither removes those variables nor estimates their contributions. Resource limitations remain distinct from opinions.

2.2 Distinguishing other platform measures

GSE records generalized capability beliefs about coping with difficulties. IE-4 concerns internal and external determinants of outcomes. Grit describes perseverance and consistency of interests; BSCS concerns self-regulation. Growth mindset centers on whether an attribute can change. Someone may view intelligence as malleable while doubting their current ability to solve a problem. Another person may feel competent without expecting much change in ability. Retain separate names, versions and scores even when constructs are related. A correlation, if later measured, does not make the questionnaires interchangeable or justify replacing one score with another.

The original matrix activity instead records correct answers to visual reasoning problems. It does not turn an opinion into observed performance. Relating both families in a class would require an authorized linkage procedure, a defined cohort and prior analytical rules. This delivery does not integrate private databases across games or automatically correlate questionnaire results with other instances. The report belongs only to its selected session. An instructor can still prepare a conceptual comparison, provided it is not described as an implemented study of the relationship between beliefs and cognitive performance. That claim requires additional data.

2.3 What answering means and what remains unknown

A self-report is a description produced under particular instructions and options. Word meanings, recent experiences, attention and social expectations can affect it. A high value here indicates greater incremental orientation under the administered form's scoring. It does not certify consistent behavior across situations or equal informativeness in every domain. Intelligence may evoke abstract reasoning, accumulated knowledge or ease with schoolwork. Avoid supplying a new definition immediately before participation, because doing so changes the task relative to the documented form. Questions about wording should be handled consistently and recorded as an administration issue when necessary.

During participation, resolve questions about controls, access and omission without recommending opinions. The welcome uses a neutral title, and instructions do not announce a preferred orientation. After closing, discuss the construct and its limits. This sequence reduces pressure to display a socially approved profile. Feedback should not become a grade or requirement for receiving learning opportunities. If someone asks what to answer to improve their score, remind them that the purpose is to record their opinion and examine measurement later. The educational value lies in reasoning about evidence rather than demonstrating agreement with an instructor's expectations.

Attention

This scale records beliefs about intelligence. It does not measure how much intelligence someone has or establish how much they will learn. Spanish is an unvalidated teaching translation. Both forms retain their own sources and are not used to classify students or allocate educational opportunities.

2.4 Provenance of both forms

The basic form follows the three-item document distributed by SPARQtools. All three statements express an entity perspective. Anchors run from 1, strong agreement, to 6, strong disagreement; a larger original answer therefore already expresses weaker agreement with stability. The source specifies averaging all three responses. The application preserves order and a first-item wording difference relative to the six-item form. Membership in the same instrument family does not justify silently standardizing those texts or exchanging their content hashes. Source identity matters even when the wording difference appears small and the general theme is shared.

The extended form uses Dweck's six-item form for children and adolescents: three entity and three incremental statements. Blackwell and colleagues document the anchors and reversal of incremental items to produce a growth-oriented average. Their article gives examples; the full transcription appears in Lottero-Perdue and Lachapelle, citing Dweck's page 177. This delivery names both sources rather than describing the complete wording as a table from the 2007 article. Its university use is a teaching demonstration without adult norms. The distinction between original validation population and current classroom purpose should remain explicit during interpretation.

Spanish translates each form separately; validation requires independent review, cognitive interviews and psychometric evidence. Language differences cannot immediately be assigned to culture. Class access retains attribution without claiming public-domain status or redistributing articles. Documented adaptations include radio options, one statement per screen and explicit omission; later validation should examine these changes.

Scoring and comparing forms

3.1 Anchor direction determines the key

In both forms, six categories progress from agreement to disagreement. A value of 1 does not independently mean strong incremental orientation: interpretation depends on item content. For an entity statement, strong disagreement produces 6 and expresses less endorsement of stability. For an incremental statement, strong agreement produces 1 and expresses greater endorsement of malleability. To orient every contribution in the six-item form consistently, its three incremental answers are transformed. Original responses remain intact in the dataset. The instructor can therefore inspect both what was selected and how it contributed to the aggregate.

Reversal subtracts an answer from seven. Thus 1 becomes 6, 2 becomes 5, 3 becomes 4, and vice versa. The first three statements are not reversed when the published anchor direction is retained. Copying a key from an implementation using 1 = disagreement would produce the opposite error. The rule depends jointly on wording and labels rather than whether an item is called positive or negative. Before programming or reconstructing scores, write the meaning of both endpoints and solve an unambiguous response pattern as a direction check. This simple exercise is more informative than memorizing reverse-item positions without their context.

Theoretical foundation

For basic editions, $M3 = (x1 + x2 + x3)/3$. For extended editions, $M6 = [x1 + x2 + x3 + (7 - x4) + (7 - x5) + (7 - x6)]/6$. Each x is an original answer from 1 to 6. Both means range from 1 to 6, with higher values expressing greater incremental orientation. Every item in the administered form is required. Omission is not a substantive scale value.

3.2 A complete example and endpoint checks

Consider original basic answers 6, 5 and 4. Their mean is $15/3 = 5$. In the extended form, add original answers 2, 3 and 4 to the incremental statements. Their coded contributions are 5, 4 and 3. The six contributions sum to 27 and average 4.5. These scores belong to different forms: the second value should not be described as deterioration caused by answering more questions. Information with opposite wording and a different denominator was added; no intervention was observed. The example teaches why an unchanged numerical range does not make two administrations a before-and-after design.

As an endpoint check, coherent incremental orientation produces 6, 6 and 6 in the basic form. In extended editions it produces 6, 6, 6, 1, 1 and 1 before scoring; the average of all coded contributions is 6. Coherent entity orientation reverses this pattern and yields 1. Selecting strong

agreement throughout the longer form instead produces 3.5 after half the answers are reversed. This illustrates the interaction between indiscriminate agreement and wording without diagnosing inattention. A response pattern should remain an observation until an explanation is supported by additional information about comprehension or administration.

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Statement 4 of 6

How much do you agree with this statement?

No matter who you are, you can change your intelligence a lot.

Your response

☐ Strongly agree

☐ Agree

☐ Mostly agree

☐ Mostly disagree

☐ Disagree

☐ Strongly disagree

☐ I prefer not to answer

Confirm response

Figure 3.1: The extended form includes three incremental statements using the same six response options.

3.3 Missing information and precision

The operational rule requires three out of three or six out of six substantive answers. If any is missing, the form mean remains absent rather than replaced by an available-item mean or midpoint. This is a conservative platform choice documented for teaching, maintaining the indicator's composition. It is not a universal missing-data rule for every study using these instruments. A future project could justify another method under explicit assumptions, but should distinguish it from this version's exported result. A reproducible analysis reports its inclusion conditions rather than allowing spreadsheet defaults to determine them.

Omission is recorded separately from six substantive categories. A pending screen also supplies no value. Item-level tables may have observations while a complete mean is unavailable; they support

progress review and scoring checks without generating a partial scale. The basic form has sixteen possible means in one-third steps; extended editions have thirty-one in one-sixth steps. Displaying two decimal places eases reading without adding psychological precision or creating percentiles. There is also no original response option exactly equal to the midpoint 3.5. A coded average at that value is not evidence that every respondent selected neutrality.

3.4 Why both forms are not administered consecutively

Extended editions do not begin by repeating the basic form. Every person sees the form assigned to the session once. Immediately repeating shared statements might encourage remembered answers, consistency seeking or recognition of the purpose. Such procedural effects complicate comparison. The edition difference concerns the administered form rather than a before-and-after sequence. Use synthetic examples or clearly identified separate groups to teach comparison. The platform does not pair responses across sessions or calculate personal changes between forms. Instructors should distinguish a proposed future study from the actual interface and data contract delivered here.

Even when groups have different means, composition, translation, context, wording and measurement error may contribute. Sharing a range of 1-6 does not establish metric equivalence. The longer form adds incremental statements and can reveal different agreement patterns. Equating forms would require specific design and evidence about structure and comparability. Do not convert M3 into M6 through proportional scaling or substitute one for the other in a pooled file. Instrument identifiers and content hashes help preserve the distinction. Matching the numerical scale is an elementary check, not sufficient evidence that both scores have identical interpretations across populations.

3.5 Effort, strategies and learning opportunities

Belief in malleability may be compatible with seeking feedback or changing methods when a task is difficult. The proposed mechanism is that the meaning of difficulty influences learning choices. A student might also value learning but lack time or resources. The scale does not observe those constraints. During discussion, formulate a chain explicitly: belief, interpretation of challenge, strategy choice and outcome. Mark which links were measured and which remain assumptions or research proposals. A chain becomes a testable explanation only when the relevant variables and contrasts are defined, rather than inferred from a favorable label attached to the questionnaire score.

For an economic connection, imagine training that costs time and has uncertain future returns. Expecting to learn may raise perceived benefits while opportunity costs or credit constraints reduce investment. This is a conceptual example rather than an additional lottery or choice implemented in the application. Keeping that distinction avoids promising an effort experiment absent from the delivery. Studying the relationship would require observing or assigning opportunities, recording choices and defining an outcome alongside belief measurement. The questionnaire can provide one component of such a design without standing in for the entire decision process or its causal identification.

Evidence, reports and classroom discussion

4.1 Reading evidence from different designs

Blackwell and colleagues combined a secondary-school longitudinal study with an educational intervention. The work motivated hypotheses about learning trajectories, but its ages, groups and procedures differ from this brief administration. The six-item form here is a measure used in that tradition, not the study's intervention. Distinguish the questionnaire recording a belief from a program intended to alter experiences or interpretations. Administering one does not administer the other or justify attributing the article's educational outcomes to this activity. This separation is a practical lesson about measurement versus treatment rather than a judgment about the value of either.

Later evidence also requires attention to context. Li and Bates studied university students without finding the grade association expected under a broad version of the hypothesis. Yeager and colleagues' national secondary-school experiment identified benefits of a brief intervention and school conditions sustaining its effects. These findings do not imply that any questionnaire improves grades or that no intervention can work. Ask about population, design, manipulated variable, outcome and setting before comparing conclusions. The classroom activity does not generate a new estimate of those effects; its observed averages describe the selected participants and administered forms.

A small class is particularly useful for learning to formulate questions, rather than resolving an empirical controversy precisely. Discuss whether a pattern is compatible with an explanation while identifying alternatives. Do not invent statistical significance or turn an absence of difference into equivalence. Before expanding a study, define the primary outcome, sample size, language procedure and exclusion rule. Prior analytical specification can reduce retrospective selection of the contrast most supportive of a story. These are research-design considerations, not functions the software claims to have completed. The guide's worked cases support that distinction using invented data with known calculations.

4.2 Progress, disclosure and denominators

The report shows participants, completed activities, completed questionnaires and scoreable questionnaires. There are no post-questionnaire decisions here, so both completion counts coincide. A person may omit a statement and finish without a mean. Score availability requires every substantive answer. Before disclosure, the instructor can review progress and access without showing aggregates. The class code stays in a collapsible panel that should be closed before

projection. Reports require authentication, and disclosure does not make individual files public. Protect the distinction between displaying a group summary and distributing records that may be linkable through classroom context.

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Growth mindset instructor report

Administered form: Implicit Theories of Intelligence — 6 items · Extended · en

Language version: Published six-item child form (Dweck, 1999, p. 177), transcribed in Lottero-Perdue & Lachapelle (2019, p. 199); scoring follows Blackwell et al. (2007, p. 249).

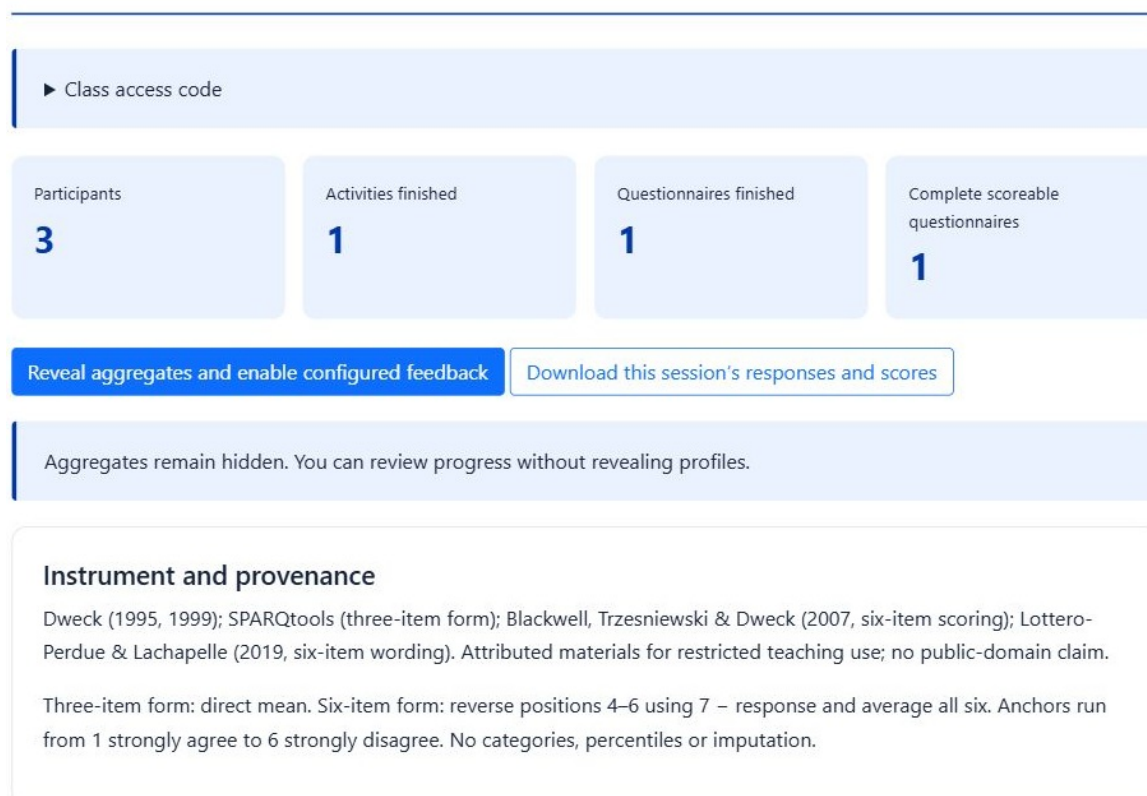


Figure 4.1: Review progress while keeping the access-code panel closed during projection.

After disclosure, the main row presents valid N, exclusions, mean, median and sample standard deviation. The mean's numerator sums complete person-level means; its denominator is that N rather than total registrations or item count. A single score does not produce sample standard deviation; no scores produce dashes. Dashes denote unavailable information rather than zero. Use a sentence retaining form, language and inclusion set: among respondents completing all six items, the coded mean was this value. That wording avoids generalizing the result to everyone in the cohort or treating incomplete participation as an extreme attitude.

4.3 Distribution and reversal checks

The chart groups means into five bins: 1 inclusive to 2 exclusive, then 2 to 3, 3 to 4, 4 to 5, and 5 to 6 with both endpoints included. Frequencies must sum to valid N. Boundaries group observations rather than separate personality types. A mean of 3 can coexist with cases at both extremes; ask students to inspect the whole shape. Widths are scaled to the largest bar, so read sample size alongside the image before comparing sessions. The interval labels do not create a validated

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Growth mindset instructor report

Administered form: Implicit Theories of Intelligence — 6 items · Extended · en

Language version: Published six-item child form (Dweck, 1999, p. 177), transcribed in Lottero-Perdue & Lachapelle (2019, p. 199); scoring follows Blackwell et al. (2007, p. 249).

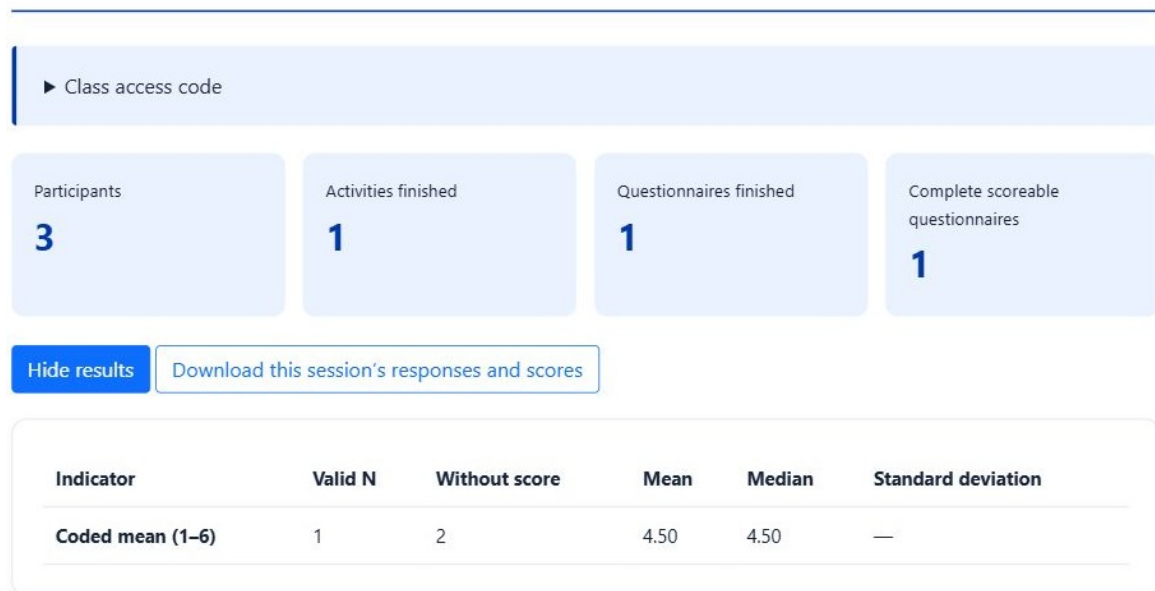


Figure 4.2: The complete mean includes only people supplying all six substantive answers.

threshold for interpreting an individual's response pattern.

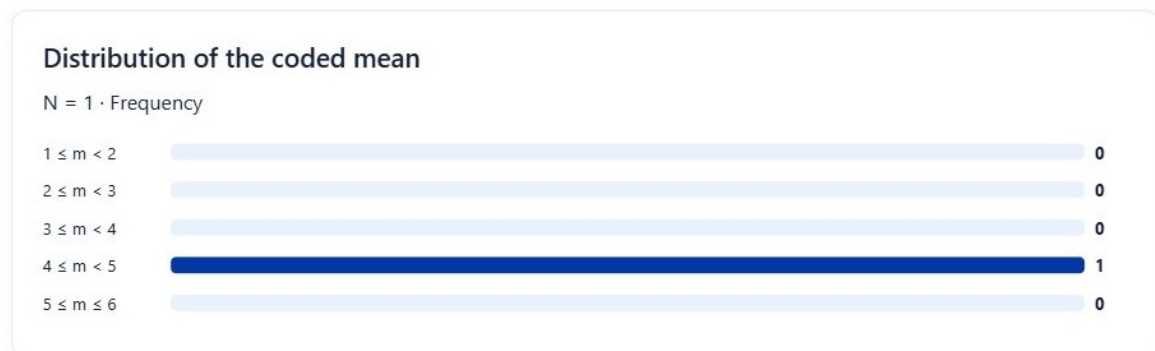


Figure 4.3: Sum frequencies and check the inclusive upper limit of the last bin.

The item table presents valid N, omissions, pending answers, reversal and original/coded means. For a reversed statement with one original answer of 2, the raw mean is 2 and coded mean 5. Each row uses its own set of respondents, so averaging the coded-mean column does not always reproduce the main mean. Equality holds when everyone contributes every item. The table does not declare new validated subscales. It is a descriptive check on data and scoring, particularly useful with incomplete questionnaires. Show how the two summaries answer different questions before asking students to reconstruct a result.

Descriptive review by statement

Each row uses its own substantive-response N. Partial item means do not replace the complete scale mean. Reversing is a scoring operation, not an alteration of the recorded answer.

Statement	Valid N	Omitted	Pending	Reversing	Original mean	Coded mean
1	1	0	2	No: direct response	6.00	6.00
2	1	0	2	No: direct response	5.00	5.00
3	1	0	2	No: direct response	4.00	4.00
4	1	0	2	Yes: 7 – response	2.00	5.00
5	1	0	2	Yes: 7 – response	3.00	4.00
6	1	0	2	Yes: 7 – response	4.00	3.00

Figure 4.4: Preserve original answers while reviewing which positions are reversed.

4.4 Closing and private feedback

Basic editions confirm recording without displaying individual scores. Extended editions can show a private mean after instructor disclosure and only after the participant finishes the whole form. If any answer was omitted, a dash preserves the missing result; reaching closing does not fabricate it. The screen requests state periodically and hides feedback again when disclosure is withdrawn. Do not project personal closing screens or ask students to announce means. Discussion can use aggregates and invented cases without revealing identifiable information. Private availability is a convenience for descriptive reflection, not permission to compare students publicly.

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Activity complete

Your responses have been recorded. Keep this screen open and wait for the instructor's directions.

Your descriptive profile in this activity

Coded mean (1–6): 4.50 / 6

This mean describes responses in this administration, from 1 to 6. Higher values express stronger agreement with malleability after this form's scoring. A dash means at least one answer is missing. It does not measure intelligence, diagnose or classify people. Spanish is an unvalidated teaching translation.

Figure 4.5: Extended closing offers descriptive feedback controlled by the instructor.

Feedback script

Today we measured agreement with statements about whether intelligence can change. The mean has a direction defined by anchors and scoring. It is not an intelligence test or a grade. Before explaining a group difference, check which form was answered, who supplied complete data and which learning conditions were unobserved. A hypothesis about effort or achievement requires additional evidence.

4.5 Download and reconstruction

The private download includes only the selected session. Each person contributes three or six item rows, including pending records, plus one mean row. Three participants produce twelve basic rows or twenty-one extended rows, besides a 26-column header. Technical identifiers link answers within the session rather than provide irreversible anonymity. `participant_label` can hold an administrator-supplied label and should be checked before sharing. Neither entry code nor administrator password is included. Keep rehearsal and classroom sessions separate so synthetic observations do not enter the cohort's actual descriptive statistics.

`session_code` and `session_config` identify cohort and configuration; `instrument`, `instrument_version`, `language` and `edition` identify form. `content_sha256` and `scoring_version` support content/calculation checks. `row_type` distinguishes item and mean. `item_number` and `source_item_id` preserve position. `response` and `response_label` are original; `reversed` identifies the key and `scored_response` the transformed contribution. `response_status` distinguishes answered, omitted and pending. `elapsed_seconds` records presentation-to-confirmation duration without being an effort measure. Mean rows use `metric`, `score`, `valid_items` and `expected_items` to explain availability. `questionnaire_finished` and `activity_finished` indicate procedural completion rather than psychometric validity or an answer's accuracy.

To reconstruct the mean, filter session, participant and item rows; check all were answered, reverse relevant values and divide by three or six. Compare with score in the mean row, counting people once. Derived rows must not be treated as additional respondents. Native files may serialize booleans as 1 and 0; the codebook defines their meaning. Native wide exports use a different layout, one row per person with rounds in columns. Both preserve technical periods, so active rounds must be distinguished. The personalized CSV already restricts rows to the administered form and retains pending statuses explicitly.

4.6 Class plan and troubleshooting

For a sixty-minute class, allocate ten minutes to access and reading, five to answering, ten to reversal calculations, ten to comparing forms using synthetic cases, ten to reports and data, ten to evidence and design, and five to a written conclusion. These are planning estimates without enforced timers. A first post-closing prompt asks why agreement raises some contributions and lowers others. A second separates a descriptive claim from a causal statement about learning. In a shorter class, use basic participation and retain the extended formula as a board exercise without describing it as an administered form.

If access fails, confirm the session and communicate its code privately. For a blank score, check omission and pending status. If Demo shows another family, stop distributing links and consult the lab; recreating databases would lose sessions. Download the intended cohort, hide results and record form, language and version. Assess reasoning while leaving personal opinions outside grading.

Worked cases for classroom preparation

What participants will see

First solve cases with synthetic data. Identify form, anchors, key, response status, inclusion rule, numerator and denominator before calculating.

5.1 Scoring and missing data

1 The short-form mean

A participant answers 6, 5 and 4 in basic editions. All items are direct because disagreement with stability already raises the value. Their sum is 15 and $M3 = 15/3 = 5$. The indicator describes incremental orientation under three statements rather than cognitive ability. A spreadsheet reversing these answers and producing 2 would use a key incompatible with published anchors. Checking an unambiguous profile provides a simple way to detect that direction error before interpreting a cohort's statistics.

2 A complete six-item mean

Original answers are 6, 5, 4, 2, 3 and 4. The last three contributions become 5, 4 and 3. The full numerator is 27 and $M6 = 27/6 = 4.5$. Preserving originals and contributions makes reconstruction possible without altering a response. The first half needs no further reversal. State the direction explicitly: a higher coded mean indicates greater incremental orientation under these labels and this form, rather than a higher level of intelligence or a better academic result.

3 A coherent incremental endpoint

Original answers 6, 6, 6, 1, 1 and 1 yield six coded contributions equal to 6. The mean is 6. Half the raw profile expresses strong disagreement and half strong agreement, yet both support a compatible belief because wording changes. Do not call this pattern inconsistent. Reversal aligns item meaning rather than penalizing disagreement or correcting an opinion the instructor considers wrong. The example shows why raw numerical similarity is not sufficient for checking substantive consistency across differently worded statements.

4 A coherent entity endpoint

The pattern 1, 1, 1, 6, 6 and 6 produces a mean of 1. It describes agreement with stability and disagreement with malleability in these statements. It does not indicate low intelligence, lack of effort or inability to learn. Invent a student with this profile who nevertheless studies and obtains good grades to discuss the distinction among constructs. None of those behaviors or outcomes is automatically recorded by the questionnaire, so they cannot be inferred from the number alone.

5 Agreement throughout the form

A participant selects 1 in all six positions. Coded contributions are 1, 1, 1, 6, 6 and 6, averaging 3.5. The mean alone does not explain agreement with opposing statements. Interpretation, attention or another response process may contribute. The item table reveals the pattern without deciding its cause. Do not automatically exclude an observation merely because it differs from the theoretically expected profile. Exclusion rules should be justified independently of whether a response supports the instructor's preferred explanation.

6 Omission and a fixed denominator

A six-item form has five substantive responses and one omission. Even if coded contributions sum to 25, the platform neither reports 25/5 nor fills the sixth position with 3.5. The mean remains missing, `valid_items` is 5 and `expected_items` is 6. The procedure may still be completed. A future project could justify another missing-data method, but would need to distinguish it from this implementation and state assumptions. More complete-looking numbers do not necessarily represent more observed information.

7 Pending versus omitted

One person answered the first three extended items and never opened the others. They have three valid answers and three pending. Another answered three and omitted three; they finished the questionnaire, yet neither has a complete mean. Statuses distinguish progress from choosing not to answer. Converting both to zero invents values outside the scale and changes the indicator. Keep substantive answers available for item-level review while acknowledging that they do not satisfy the complete-form inclusion rule.

8 There is no neutral button

Original categories number six: 3 means mostly agree and 4 mostly disagree. An average of 3.5 can arise from combining contributions without implying that each answer was neutral. An undecided participant may use explicit omission. Do not add a seventh midpoint option or recode omission as a midpoint, because either changes the administered form. The difference between response categories and computed statistics is itself a useful lesson in measurement and should be explained before interpreting a central mean.

5.2 Reporting and data reconstruction

These cases move from individual scoring to group summaries and exported records. Keep person counts, item counts and inclusion rules separate throughout the reconstruction.

9 Averaging complete person means

Three people have means of 2, 4 and 6. Their group mean is 4, median 4 and sample standard deviation 2. A fourth incomplete person raises participants to four while valid N remains three. The numerator twelve must not be divided by four. Standard deviation describes dispersion in three observed scores; it does not establish population precision, translation quality or instrument reliability in this class. Preserve both cohort size and valid-score count when reporting what was observed.

10 The histogram's upper endpoint

Valid means are 1, 2, 3, 4, 5 and 6. Five bars contain 1, 1, 1, 1 and 2 observations. Six belongs in the last bar, which includes both endpoints; internal boundaries enter the bin starting at them. Frequencies sum to six. These are graphical groups, not personality classes. Do not interpret boundary 4 as a validated distinction between student types or label the chart's extremes as diagnoses. Boundary rules ensure exhaustive counting without imposing a psychological threshold.

11 A single scoreable case

Five people are registered but only one completed the form without omission. If their mean is 4.5, the report shows $N = 1$, mean and median 4.5, and a dash for standard deviation. Zero dispersion would be inappropriate because sample standard deviation needs two observations. Four exclusions are not four scores of one. Describe the available result and inclusion conditions before comparing it with another cohort, and avoid presenting a single response pattern as a precise estimate of a population's beliefs.

12 Item rows use different sets

A answers all six items with a coded mean of 4.5. B answers only the first three with value 6. The main mean includes A alone. The first three item rows include A and B; the last three include only A. Averaging six row means can therefore produce another value. Nothing is contradictory: inclusion sets differ. Item tables review responses and progress, whereas the principal row summarizes complete person forms. Always identify the unit and denominator before comparing these calculations.

13 Checking a reversed export row

A position-4 row shows $\text{response} = 2$, $\text{reversed} = 1$ and $\text{scored_response} = 5$. Reconstruct $7 - 2 = 5$. Exporting $\text{response} = 5$ instead would lose the original selection. Reversing a position-1 value of 6 would improperly change its direction. Check instrument, position and anchors before transformation; an isolated boolean does not document the whole form. Native CSV serialization of true as 1 is a representation detail rather than evidence that the person chose category one.

14 Counting rows without duplicate people

With three participants, basic exports have nine item rows and three mean rows: twelve. Extended exports have eighteen and three: twenty-one. Pending items are included. A mean row is derived information rather than an additional respondent. Count distinct participant codes within `session_code` to count people. For the group mean, select mean rows with available score. Do not

average the entire response column or pool forms just because their ranges match. Their identifiers preserve a substantive distinction the analysis should respect.

15 Completion and score availability

One person submitted six screens while omitting an item. They count as activity and questionnaire complete but not scoreable. Another has five substantive answers and is still on the sixth screen: neither complete nor scoreable. The report distinguishes these situations. If the first receives extended private feedback after disclosure, they see a dash rather than an imputed mean. Display policy permits consulting an available result or its absence; it does not alter the calculation or supply a missing substantive answer.

16 Withdrawing private feedback

An extended participant finishes and the instructor reveals. Closing shows the mean when its periodic update arrives. Hiding results removes it on the next request. Basic editions never enable private feedback even when aggregates are revealed. These are information rules separate from scoring. Do not circulate an individual screenshot assuming disclosure controls make its contents anonymous. Use synthetic examples or aggregate tables and keep the access panel closed during projection. Classroom context may identify someone even without a name in the displayed panel.

5.3 Comparisons and research questions

17 A common range does not equate forms

A basic group has mean 5 and an extended group 4.5. The descriptive difference is half a point, but people and item composition differ. It does not mean six questions reduced a belief or that M3 converts to M6 by subtracting 0.5. Equivalence assessment would require specific design. Report both summaries with instrument, language and N, then explain alternatives that remain open despite correct arithmetic. Matching units is necessary for many comparisons but does not by itself establish interchangeable measurement.

18 Comparing languages

Spanish and English groups have means 4.2 and 4.8 with the same form length. The Spanish translation is unvalidated and cohort composition may differ. A difference of 0.6 identifies neither culture nor a language effect. It can be described with limits without creating a ranking. Research would require language procedures, comparability evidence and a design separating selection differences. Evidence collected for another population or language pair does not transfer automatically to this classroom comparison, however similar the labels appear.

19 Belief and performance

A student has incremental mean 6 and answers an arithmetic problem incorrectly. There is no necessary inconsistency: a belief about malleability does not guarantee present knowledge of a particular problem. Someone with mean 1 may solve it. Studying relationships requires linked observations of both variables and an analytical design. This activity has no additional performance task; a classroom example of correctness should be identified as an external exercise and kept separate from questionnaire scoring. One response cannot stand in for both constructs.

20 A hypothetical training investment

Imagine training with opportunity cost 20 and future benefit 100 if a skill is mastered. A subjective probability of 0.4 gives expected net benefit 20; probability 0.1 gives -10. Belief in learning may influence that probability, but this scale neither elicits it nor observes the choice. The example illustrates a possible economic mechanism without estimating parameters. Time or resource constraints may also prevent investment despite positive expected benefits. Label all numbers as invented teaching inputs rather than outcomes generated by the platform.

21 Measurement and intervention

An instructor administers the scale and observes mean 4.7. They cannot conclude that a growth mindset intervention occurred or grades improved. A questionnaire records answers; an intervention modifies experiences, messages or conditions under a protocol. Evaluating effects requires a contrast, an outcome and an assignment procedure. Literature can inform that design without transferring its findings to a class that only answered statements. The report supports a descriptive measurement lesson rather than a claim that taking the questionnaire constitutes a treatment.

22 Designing an interpretable follow-up

A group proposes comparing learning after offering feedback to part of the class. Before data collection, define what is assigned, which outcome is observed, when it is measured and how educational opportunities are protected. A baseline questionnaire could be a covariate or moderator rather than an ability test. The follow-up is not implemented here. Preserve forms, language versions, missing-data rules and prior analysis decisions rather than selecting afterward the subgroup producing the most striking result. Good research design begins with the question and contrast, not the preferred conclusion.

Checkpoint

Check session, language, edition and access. Review N per measure, choose disclosure and download only the intended cohort. Do not equate forms or classify people.

References and attribution

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