
AP[®] Psychology

Sample Student Responses and Scoring Commentary Set 1

Inside:

Free Response Question 2

- ☒ **Scoring Guideline**
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Question 2: Research Methodology**7 points****General Considerations**

1. Answers must be cogent enough for the student’s meaning to come through. Spelling and grammatical mistakes do not reduce a student’s score, but spelling must be close enough so that the reader is convinced of the word.
2. A student can earn points only if the student clearly conveys what part of the question is being answered. It is possible to infer the part of the question being answered if it is consistent with the order of the question.
3. The response must apply the concept to the prompt; a definition alone will not earn the point.
4. Examples provided in the Scoring Guidelines for each of the points are not to be considered exhaustive.
5. Within a bulleted question part, a student will not be penalized for misinformation unless it *directly contradicts* correct information that would otherwise have earned a point. For example, if a response applies a concept in two contradictory ways (such as identifying both the measured variables as the independent variable or describing proactive interference as interference from both older and newer information), the point is not earned.
6. Within a bulleted question part, if the response addresses details from a scenario other than the one in the prompt, the point is not earned.

Part A Mr. Gomez decides to conduct a study with his sixth-grade math class, after first obtaining informed consent. Half of his students happen to arrive early for class (group 1), so he uses the time to give them some extra problem-solving tips. The next week he compares their scores on a quiz with the scores of the students who arrived on time (group 2) and did not receive the tips. The students’ grades are represented in the table below. Mr. Gomez comes to the conclusion that the problem-solving tips led to higher scores on the quiz. Mr. Gomez posts the table of grades on the door of his classroom to emphasize that the tips helped improve the students’ grades.

Group 1	Grade on Quiz	Group 2	Grade on Quiz
Jaime	4	Lynda	3
Steven	5	Adam	4
Thomas	3	Sami	1
Elizabeth	3	Marlena	1
Marwa	7	Kiara	5
Frances	6	Caylin	4
Fekru	3	Darin	2
David	6	Chinami	4

Identify the dependent variable presented in the study.**1 point**

The response must indicate score on the quiz as the dependent variable.

Acceptable explanations include:

- *The dependent variable is the score the students earn on the quiz.*

Unacceptable explanations include:

- *The dependent variable is the one that is measured.*
 - *The dependent variable is the problem-solving tips.*
-

Explain how the study could be modified to be an experiment.**1 point**

The response must indicate that the study could be modified by adding random assignment to make it an experiment.

Acceptable explanations include:

- *The study needs to have random assignment in each experimental condition in order for it to be an experiment.*
- *Mr. Gomez would need to put people in groups randomly in order to make this an experiment.*

Unacceptable explanations include:

Responses that refer to the manipulation of a variable without discussion of random assignment.

Responses that refer to flaws in research design, such as sampling bias, or other confounding variables.

- *Mr. Gomez manipulated his variable, which makes it an experiment.*
 - *Mr. Gomez might avoid bias by randomly selecting people for his study.*
 - *Mr. Gomez would have to make sure that both groups received instructions for the quiz at the same time.*
-

Compare the mode of Group 1 to the mode of Group 2.**1 point**

The response must indicate either that the mode of Group 1 is lower than the mode of Group 2 (or vice versa).

OR

The response must indicate that the mode of Group 1 is 3, and the mode of Group 2 is 4.

Acceptable explanations include:

- *The mode of group 1 is lower than group 2.*
- *Group 1's mode is 3 and Group 2's mode is 4, so they are different.*

Unacceptable explanations include:

- *The groups modes are irrelevant.*
-

Identify the measure of central tendency that needs to be calculated to determine the standard deviation. **1 point**

The response must indicate that the mean is the measure of central tendency that is calculated to determine the standard deviation.

Acceptable explanations include:

- *Mr. Gomez must calculate the mean in order to determine the standard deviation.*
- *The mean.*

Unacceptable explanations include:

Responses that refer to any other measures of central tendency besides the mean.

- *Mr. Gomez must calculate the mode to determine the standard deviation.*
- *The median.*

Explain the ethical flaw that is explicitly presented in the study. **1 point**

The response must indicate that Mr. Gomez posted the students' grade (or did not maintain confidentiality/anonymity of the students' grades).

Acceptable explanations include:

- *Mr. Gomez posted every kid's name with their score.*

Unacceptable explanations include:

- *Mr. Gomez did harm to his students in this study.*
-

Explain how metacognition could apply to the scenario.**1 point**

The response must indicate that an individual in the scenario thinks about their own thinking.

Acceptable explanations include:

Responses that refer to cognitive strategies that may be used to improve scores on their quizzes, awareness of their knowledge or understanding, monitoring progress of their learning, etc.

- *Students in this study might keep track of how well they do, so they can study better for each test.*

Unacceptable explanations include:

Responses that refer to trying to do better, working harder, or listening better without discussion of the individual's thinking about their thinking.

Responses that refer to thinking about anything other than an individual's own thinking or the word "study" by itself without reference to some metacognitive process.

Responses that refer to anyone else's thinking about an individual's thinking.

- *Students will need to work harder as they learn so they can do better.*
 - *Students study more throughout the term.*
 - *Students listen to what the teacher says about their thinking, which helps them do better.*
-

Part B Suppose Mr. Gomez had conducted this study as an experiment without any flaws and obtained the same results and that the results were statistically significant.

Explain how the findings depicted in the table above could support the theory of levels of processing.

1 point

The response must indicate either that Mr. Gomez used problem-solving tips that promoted deep processing and increased scores.

OR

The response must indicate that the group that did not receive the tips used shallow processing and scored worse.

Acceptable explanations include:

- *Students who used the problem-solving strategies used deep processing and that helped them learn more in class.*
- *Mr. Gomez's strategies worked well because they helped students process things more deeply.*
- *Students who did not use the problem-solving strategies used shallow processing and learned less in class.*

Unacceptable explanations include:

- *Students who process things on multiple levels can learn better.*
- *Students who use their long-term memory do better than students who use their short-term memory.*

Total for question 2 7 points

Q2 Sample 2A 1 of 1

Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

- The dependent variable is students' grades on this quiz, marked by how many points they got correct.
- This study could be modified to be an experiment by using random assignment to divide the group into the experimental and control groups. This could prevent confounding factors' interference in the study the best way.
- Group 1's mode is 3, which is less than Group 2's mode which is 4. This means the most occurring score in Group 1 was 3 while the most occurring score for Group 2 was 4.
- The measure of central tendency that should be calculated to determine the standard deviation is the mean, or average.
- An ethical flaw that is explicitly presented is that there is no confidentiality with students' scores. Mr. Gomez posted each kid's name and score on the door for everyone to see.
- Metacognition is thinking about the way you think. The problem-solving tips that Mr. Gomez gave ~~the students~~ ^{kids} helped them think about the way that they thought about the quiz problems, leading them to get generally higher scores on the quiz.
- The group that got tips, group 1, thought more deeply about the meaning of problems, ~~processing~~ semantically, so they understood the questions better. The problem-solving tips could have led them to create algorithms and solve problems with a more effective way. Group 2 with no tips thought less semantically and more superficially, not processing the questions as well, ultimately getting generally lower scores.

Q2 Sample 2B 1 of 2

Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

The ~~dependent~~ dependent variable is the effect of the study, the thing they're looking for. In this study, it would be the student's grades on the quiz.

Contrary to an experiment, this study doesn't have any random assignment. So in order to make this study an experiment, the students in each group needs to be completely random. It could even be determined by coin flip.

The mode is the most frequently appearing number in a study or graph. This means the mode for group 1 is 3, while the mode for group 2 is 4.

The measure of central tendency is how you set the average for a study or experiment. The most effective method to use would be the mean so you could effectively calculate standard deviations.

There is one huge ethical flaw in this ~~exam~~ study and that would be anonymity. The teacher released all the student's names, even though it was unethical.

Metacognition could apply because some students may have more experience or may be smarter than other students. The teacher's tips may even interfere, which creates metacognition.

Q2 Sample 2B 2 of 2

Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

These findings could support the theory of levels of processing because group 1, on average, received higher scores than group 2. This shows that the tips could prime the students and create a higher level of processing and thinking than group 2.

Q2 Sample 2C 1 of 2

Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

Mr. Gomez's study with his sixth-grade math class is done to see which group, ~~A or B~~, 1 or 2, will do better on the quiz. Group 1 received ~~the~~ help by obtaining problem-solving tips, while group 2 did not receive any tips. The dependent variable of this study are the groups, group 1 and group 2. This study could be modified into an experiment by first creating a hypothesis. ~~Then a hypothesis could be created~~ Two groups could be formed, group 1 and 2. Group 1 will receive extra problem-solving tips before taking the quiz, and Group 2 will not receive any help and will take the quiz right away. After the results come out, the hypothesis would ~~be~~ either be correct or incorrect. Group 1 had ~~more scores of~~ a mode of 3, while Group 2 had a mode ~~of~~ 4. Seemingly, Group 2 had a higher mode than Group 1. The measure of central tendency needs to be calculated with consistency to determine the standard deviation. Explicitly, the ethical flaw coming from this study presents the different ~~the~~ intelligence levels of each student. Not only does the intelligence level factor in, not all students are able to come in early to receive that extra help. With this, ~~this problem~~ the problem points to an ethical flaw.

metacognition could apply to the scenario by creating a consistent flow of time that will ensure the students

Q2 Sample 2C 2 of 2

Question 1 Question 2



Begin your response to each question at the top of a new page. Do not skip lines.

equal time and work. If Mr. Gomez conducted this study as an experiment without any flaws, the findings could support the theory of levels of processing. It could do so ~~by~~ because the statistics show that students are able to process information if given the extra help. With this, the students ~~was~~ received higher scores when getting extra help. Although this is the case, this study had many ~~etic~~ ethical flaws manipulating the scores of the students.

Question 2

Note: Student samples are quoted verbatim and may contain spelling and grammatical errors.

Overview

The responses to this question were expected to demonstrate an understanding of critical components of quantitative analysis and interpretation, as well as analysis of psychological research with respect to experimental design (i.e., random assignment and types of variables), basic statistical tools, and how specific psychological terminology applies to a scenario in which an experiment’s methodology and results are presented. Specifically, responses needed to address a sixth-grade math teacher’s in-class study, in which he provided problem-solving tips to one group of students but did not provide them to another group of students. The responses needed to identify the dependent variable in the study, explain how random assignment would make the study a true experiment, compare the modes of the two groups in the study, identify the measure of central tendency needed to calculate the standard deviation, explain how metacognition could apply to the scenario, and explain how the study’s results could support the theory of levels of processing.

Sample: 2A

Score: 7

The response earned point 1 because the response indicates that the dependent variable is the quiz grade. The response earned point 2 because it indicates that there is a need for random assignment. The response earned point 3 because the response indicates the correct modes of both Group 1 and Group 2, and it also correctly identifies which group has the lower mode. The response earned point 4 because the response indicates that the mean is the measure of central tendency that is necessary for calculating the standard deviation. The response earned point 5 because it indicates that the violation of confidentiality/anonymity is an explicitly presented ethical flaw. The response earned point 6 because the response indicates that the students are thinking about their own thinking processes. The response earned point 7 because the response indicates that Group 1 is engaging in deep processing and doing so improves their understanding of the material.

Sample: 2B

Score: 5

The response earned point 1 because the response indicates that the dependent variable is the quiz grade. The response earned point 2 because it indicates that there is a need for random assignment. The response earned point 3 because the response indicates the correct modes of both Group 1 and Group 2. The response earned point 4 because it indicates that the mean is the measure of central tendency that is necessary for calculating the standard deviation. The response earned point 5 because the response indicates that the violation of confidentiality/anonymity is the explicitly presented ethical flaw. The response did not earn point 6 because the response does not indicate that an individual in the scenario is thinking about their own thinking. The response did not earn point 7 because the response does not indicate that Group 1 is engaging in deep processing or that Group 2 is engaging in shallow processing, and the response does not indicate the corresponding effects on the quiz scores. Furthermore, “higher” processing is not equivalent to “deep” processing.

Question 2 (continued)

Sample: 2C

Score: 1

The response did not earn point 1 because the response does not indicate that the dependent variable is the quiz grade. The response did not earn point 2 because the response does not indicate that there is a need for random assignment. The response earned point 3 because it indicates the correct modes of both Group 1 and Group 2 and correctly identifies which group has the higher mode. The response did not earn point 4 because the response does not indicate the mean as the necessary measure of central tendency for calculating the standard deviation. The response did not earn point 5 because the response does not indicate that the violation of confidentiality/anonymity is the explicitly presented ethical flaw. The response did not earn point 6 because it does not indicate that an individual in the scenario is thinking about their own thinking. The response did not earn point 7 because the response does not indicate that Group 1 is engaging in deep processing or that Group 2 is engaging in shallow processing, and the response does not indicate the corresponding effects on the quiz scores.