Past year paper 1

(a) Identify the independent variable of the research. (2 marks)

Students' use of technology (2 marks)

(b) Identify the dependent variable of the research. (2 marks)

Learning achievements in physiology courses (2 marks)

(c) Provide ONE (1) null hypothesis (3 marks) and ONE (1) alternative hypothesis (3 marks) of the research.

(Sample answers, other correct answers are acceptable)

Null hypothesis: There is no significant relationship between students' use of technology and their achievements in physiology courses. (3 marks)

Alternative hypothesis: Students' use of technology is positively correlated with their achievements in physiology courses. (3 marks)

(d) Is there any kind of validation which has been done on the instrument (questionnaire)?

(d) Is there any kind of validation which has been done on the instrument (questionnaire)? (1 mark). Explain (3 marks).

Yes. (1 mark)
The instrument (questionnaire) was validated by two subject matter experts for objectives-based content and questions of the measure. (3 marks)

(e) Do you think the instrument (questionnaire) used in the study is reliable? (1 mark) Explain (3 marks).

Yes. (1 mark)
The instrument (questionnaire) used in the study has an internal consistency of 0.73, which is acceptable. Thus, the instrument (questionnaire) can be considered as reliable. (3 marks)

(f) Pearson's Correlation is a technique for investigating the relationship between two quantitative, continuous variables. Originally, is **use of technology** a continuous variable? If no, explain the transformation process of the variable into a continuous variable.

(4 marks)

Originally **use of technology** is measured using 6 questions/items on Likert scale, which is an ordinal scale, on which arithmetic operations cannot be performed. In this study, the items on Likert scale has been transformed into a continuous variable by calculating the sum of the responses of these 6 questions/items. (4 marks)

(g) Is this research an experimental design (0.5 marks)? Justify your answer (2.5 marks).

This research is an experimental design, because independent variable (use of the technology) is manipulated to identify the changes on the dependent variable (students' achievements in physiology courses). (3 marks)

[Total: 25 marks]

Past year paper 2

Q1)   What is the objective of the study?   (3 marks)

To analyse student perspective of Student Centered Active Learning (SCAL) delivered through full distance learning compared to the classroom learning in the undergraduate dentistry study program.

Q2)   What is the main rationale for conducting the study (research gap)?   (3 marks)

While there are many past studies conducted to compare classroom and distance learning, the evaluation on the student-centered active learning approaches that are delivered through blended learning methods compared to full online learning has not been widely available.

Q3)   By referring to the research article, identify the following research design parameters:
(i)   Type of respondent (1 mark)
(ii)   Number of questions/items in the questionnaire (1 mark)
(iii)   Data collection method (1 mark)
(iv)   Geographic scope (1 mark)
(v)   Sample size (1 mark)
(vi)   Duration of the data collection (1 mark)

(i)   first, second and the third year of undergraduate students of the dentistry study program (1 mark)
(ii)   22 statements (1 mark)
(iii)   online questionnaire (1 mark)
(iv)   Faculty of Dentistry Universitas Indonesia / Indonesia (1 mark)
(v)   301 students (1 mark)
(vi)   May to June 2020 (1 mark)

Q4)   Classify the data collected for the following variables as nominal, ordinal, interval or ratio and as discrete or continuous.

(i)   Part A (General information) – students' gender, year of study and GPA (2 marks)
(ii)   Mean score value for collection of items for Part B (Preference), Part C (Effectiveness) and Part D (Learning satisfaction).   (2 marks)

(i)   Nominal – Discrete data (2 marks)
(ii)   Ratio – Continuous data (2 marks)

Q5) Assume the researchers would like to test the following research questions:

(i) Is there a significant difference in learning satisfaction of distance learning among the students of different year of study?

(ii) Is there a significant difference in learning satisfaction of distance learning among the students of different gender?

Based on the two research questions stated above, write the corresponding null hypotheses (4 marks) and state the data analysis techniques that should be adopted to test the hypotheses. (2 marks)

(i) Null hypothesis:
There is no significant difference in learning satisfaction of distance learning among the students of different year of study. (2 marks)
Data analysis technique: one-way ANOVA (1 mark)

(ii) Null hypothesis:
There is no significant difference in learning satisfaction of distance learning among the students of different gender. (2 marks)
Data analysis technique: t-test (1 mark)

Q6) By referring to this research article, do you think non-sampling error due to nonresponse errors should be considered as one of the main concerns that could affect the validity of study results (1 mark)? Justify your answers (3 marks).

Yes (1 mark). The non-sampling error due to nonresponse errors is one of the main concerns that could affect the validity of study results. The response rate for the study was 84.3% which was below 90% response rate that was initially targeted. This nonresponse error could be resulted due to sensitive questions or even due to wrong respondents selected to participate in the study (3 marks).

Q7) Has sampling technique been described in the study (1 mark)? Give ONE (1) importance of selecting an appropriate sampling technique for quantitative study. (3 marks)

No (1 mark). Sampling technique not stated in the research article. An appropriate sampling technique is important to avoid the occurrence of sampling bias, when the sample does not reflect the characteristics of the population (3 marks).