ASSESSMENT OF GEOGRAPHICAL ENQUIRY SKILLS

How to tackle HKDSE Fieldwork-based questions effectively?

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Chan Chin Lee

GEOGRAPHY & FIELDWORK

- Geography is the study of the earth and the interrelationships between people and environment.

- 'Fieldwork is a distinctive attribute of geography and has a long tradition as an established component of geographical education.' (S4-6 Geography C & A Guide)

ASSESSMENT OF FIELDWORK SKILLS

- HKCEE & HKALE: not compulsory
- HKDSE: compulsory
- School-based Assessment (SBA) (teachers' handbook trial version 2009)
- Fieldwork-based Questions (FBQ)
- Streamlining - Fieldwork experience in 3 selected modules
- HKDSE 2019 &2020: Compulsory FBQ
- Streamlining in 2021 – 2024: FBQ optional question, and fieldwork experience in ONE selected module
- Back to normal (compulsory question) in 2025 ?

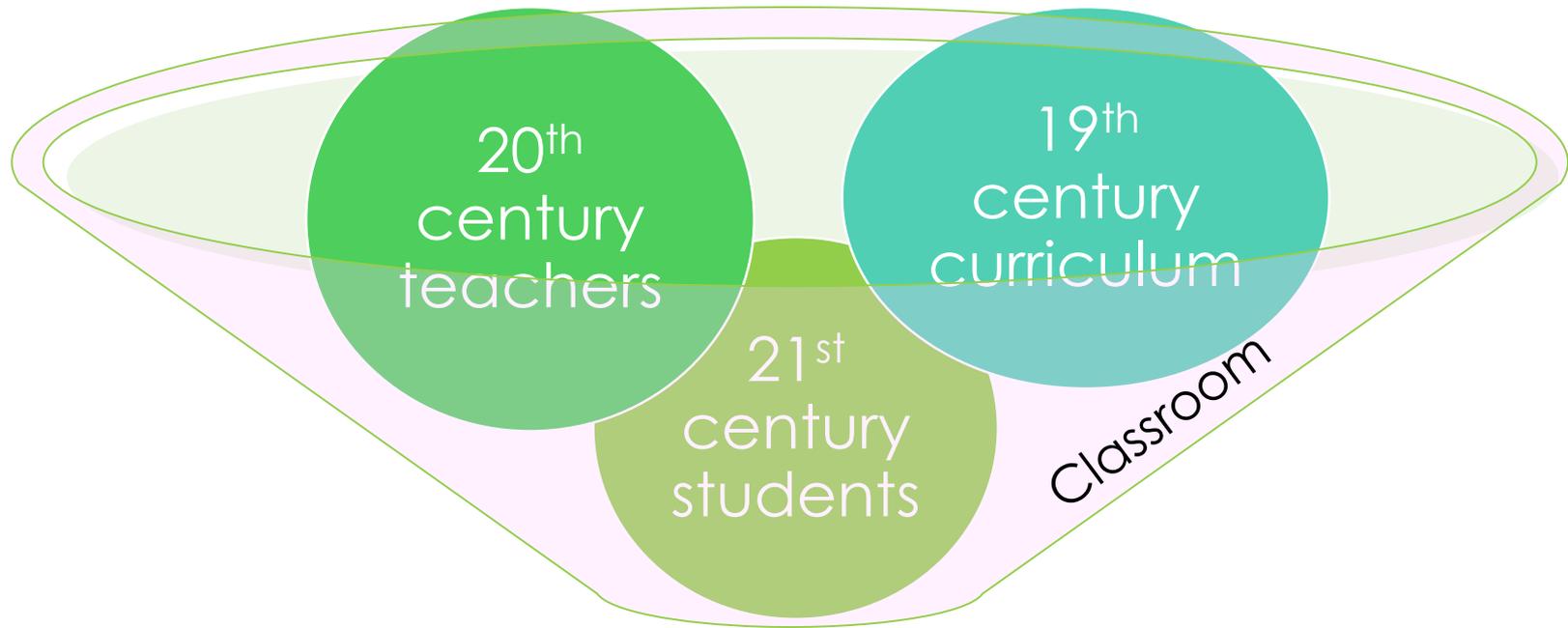Should fieldwork skills be assessed in HKDSE?

How to tackle HKDSE fieldwork questions effectively?

-How are the fieldwork skills assessed?

-How did the candidates perform in HKDSE FBQ?

-How could we prepare our students?

The way forward ?

SHOULD FIELDWORK SKILLS BE ASSESSED IN HKDSE?

20th century teachers

19th century curriculum

21st century students

Classroom

Learning outcome?

HKDSE

Adequate for the challenging 21st century?

S4-6 GEOGRAPHY CURRICULUM –19TH, 20TH OR 21ST CENTURY?

Learning to learn
-Lifelong learning
-Life-wide learning
-Self-directed learners

-Adopt enquiry approach
-Equips our students to become geographically informed and inquiring people who:
ask geographical questions and find answers through enquiry

(S4-6 Geography C & A Guide)

GEOGRAPHICAL ENQUIRY SKILLS & FIELDWORK SKILLS

the ability to:

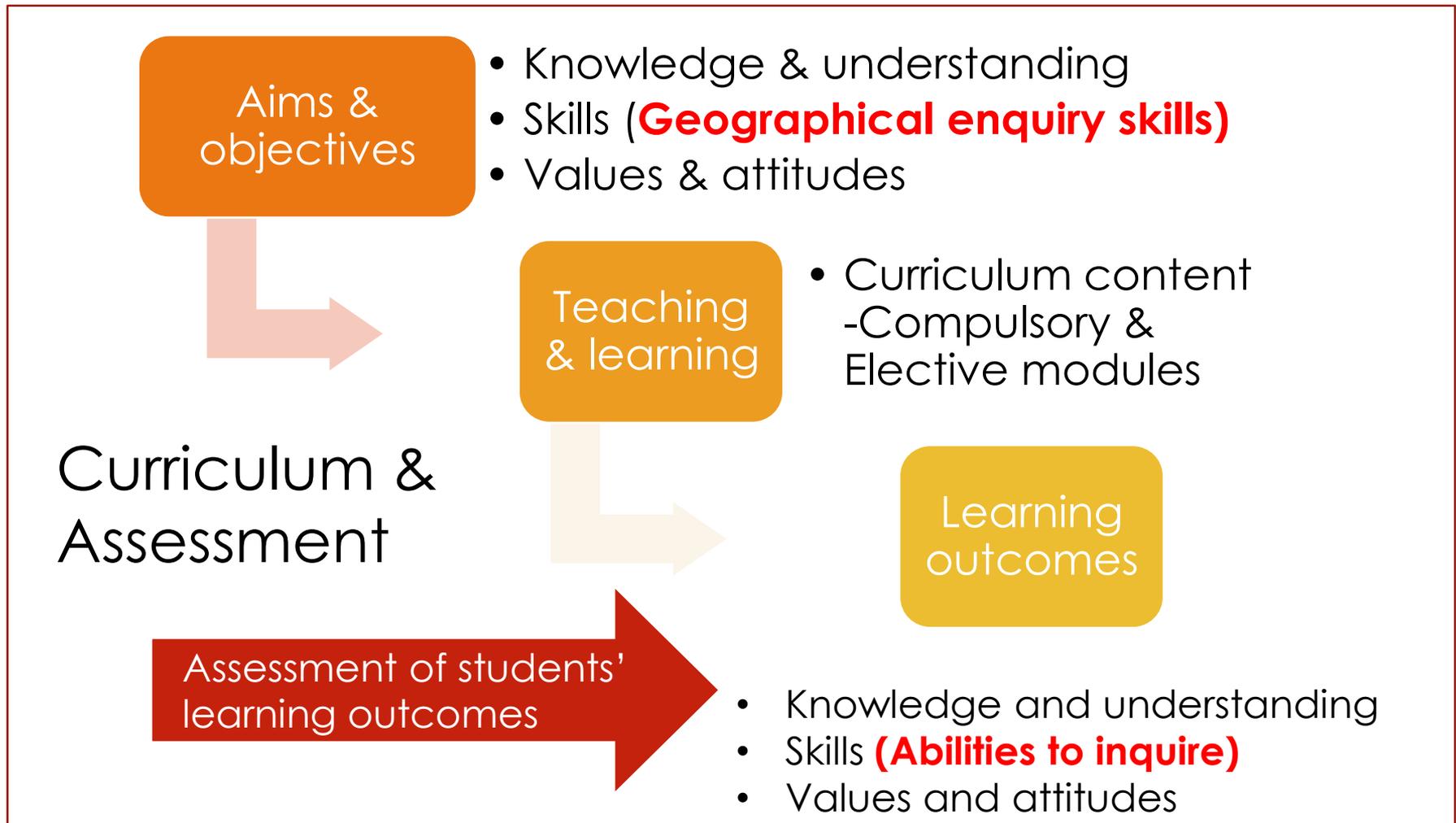- identify and ask questions from a geographical perspective;

- locate, select and extract appropriate information and data from primary and secondary sources (e.g. the field, surveys, maps, graphs, charts, ground and aerial photos and Geographic Information System [GIS] data etc.);

- observe and record data systematically and accurately;

- present and organise information and data:

  - use appropriate techniques for summarising

  - use appropriate formats, such as texts (e.g. reports, tables, summaries, etc.) and illustrations (such as maps, diagrams, models, sketches, and graphs);

- compare, analyse, synthesise and evaluate, in order to interpret information and data for making inferences and drawing conclusions:

  - the use of appropriate statistical techniques (e.g. correlation);

  - analysis of spatial patterns using GIS.

  (S4-6 Geography C&A Guide 1.5 Curriculum objectives : 1.5.2 skills)

21ST CENTURY GENERIC SKILLS

Which of these skills are required in a Geographical fieldwork enquiry?

9 Generic skills to be lifelong and self-directed learners		
Basic skills	**Thinking skills**	**Personal & social skills**
Communication skills	Critical thinking skills	Self-management skills
Mathematical skills	Creativity	Self-learning skills
IT skills	Problem solving	Collaboration skills

Assessment of geographical enquiry skills (21st century learning skills)

Aims & objectives

- Knowledge & understanding
- Skills (**Geographical enquiry skills)**
- Values & attitudes

Teaching & learning

- Curriculum content -Compulsory & Elective modules

Learning outcomes

Curriculum & Assessment

Assessment of students' learning outcomes

- Knowledge and understanding
- Skills **(Abilities to inquire)**
- Values and attitudes

THE ROLES OF PUBLIC ASSESSMENT (HKDSE)

Geographical enquiry's skills

Collecting evidence of student learning

Monitoring learning progress & providing Feedback

- Students strength & weakness
- Teachers effectiveness of teaching
- Schools, parents etc.

Monitoring standard

- Certification
  - achievement
- Selection
  - Further study
  - employment

HOW ARE THE FIELDWORK ENQUIRY SKILLS ASSESSED IN HKDSE?

'Fieldwork-based question will be introduced to the public examination to assess students' fieldwork abilities. Students' knowledge and skills in different stages of Geography fieldwork are to be tested.' (S4-6 Geography C&A Guide)

Reliability

Fairness

Validity

Inclusiveness

- Data-based question
- Data/ information about a hypothetical fieldwork
- Application of knowledge, understanding and technical skills required in the 5 stages of fieldwork enquiry
- 3 Restricted response questions (12 marks)
  + 1 More open-ended restricted response question (6 marks)

Examination time

Selected modules

CANDIDATES' PERFORMANCE IN HKDSE FBQ 2019-2022

Exam year	2019	2020	2021	2022
Mean	4.70	6.67	5.51	3.72
% marks	26.1	37.1	30.6	20.6
Highest	15	17	16	14
Popularity (%)	Compulsory	Compulsory	2	1

(Source: HKEAA)

HOW TO HANDLE HKDSE FBQ EFFECTIVELY?

Key

Frame

Short-cut

Tips

THINKING PROCESSES IN ANSWERING FBQ

(1) Interpretation of questions

(2) Interpretation of information –specific situation

(3) Recall of relevant knowledge

(4) Application of knowledge to the specific situations

(5) Organization & expression of ideas; make judgements

(b) *The students decided to conduct interviews to investigate the impact of urban encroachment on agricultural land uses in area X.*
Describe how the interviews could be conducted in order to collect the necessary information. (2021 HKDSE)

Interpretation of question: describe, how, interview, collect, necessary information

Data interpretation (map): geographical setting – distribution of rural settlement – field study sites

Recall of knowledge: impact of urban encroachment, (validity of data), sampling methods, interview methods, questionnaire design etc.

Application of knowledge, organization of ideas

UNDERSTANDING & ABILITIES

Abilities to **Interpret data**

Maps (location, geographical settings, sites), numerical data (recorded data) sketches, diagrams (presentation of data), photograph, words

Knowledge & understanding of the topic & issues

Abilities to **apply knowledge** & **understanding** of geographical fieldwork enquiry

Fieldwork planning & preparation, data collection, data processing, presentation & analysis, interpretation and conclusion, evaluation

Abilities to **interpret questions**

Objectives, reliability & validity of fieldwork

Abilities to **express ideas**

WHAT KNOWLEDGE & SKILLS ARE ASSESSED IN FBQ?

Stages of Geography fieldwork enquiry

Planning & preparation

Evaluation

Geographical concepts, knowledge & enquiry Skills

Data collection

Interpretation & conclusion

Data processing, presentation & analysis
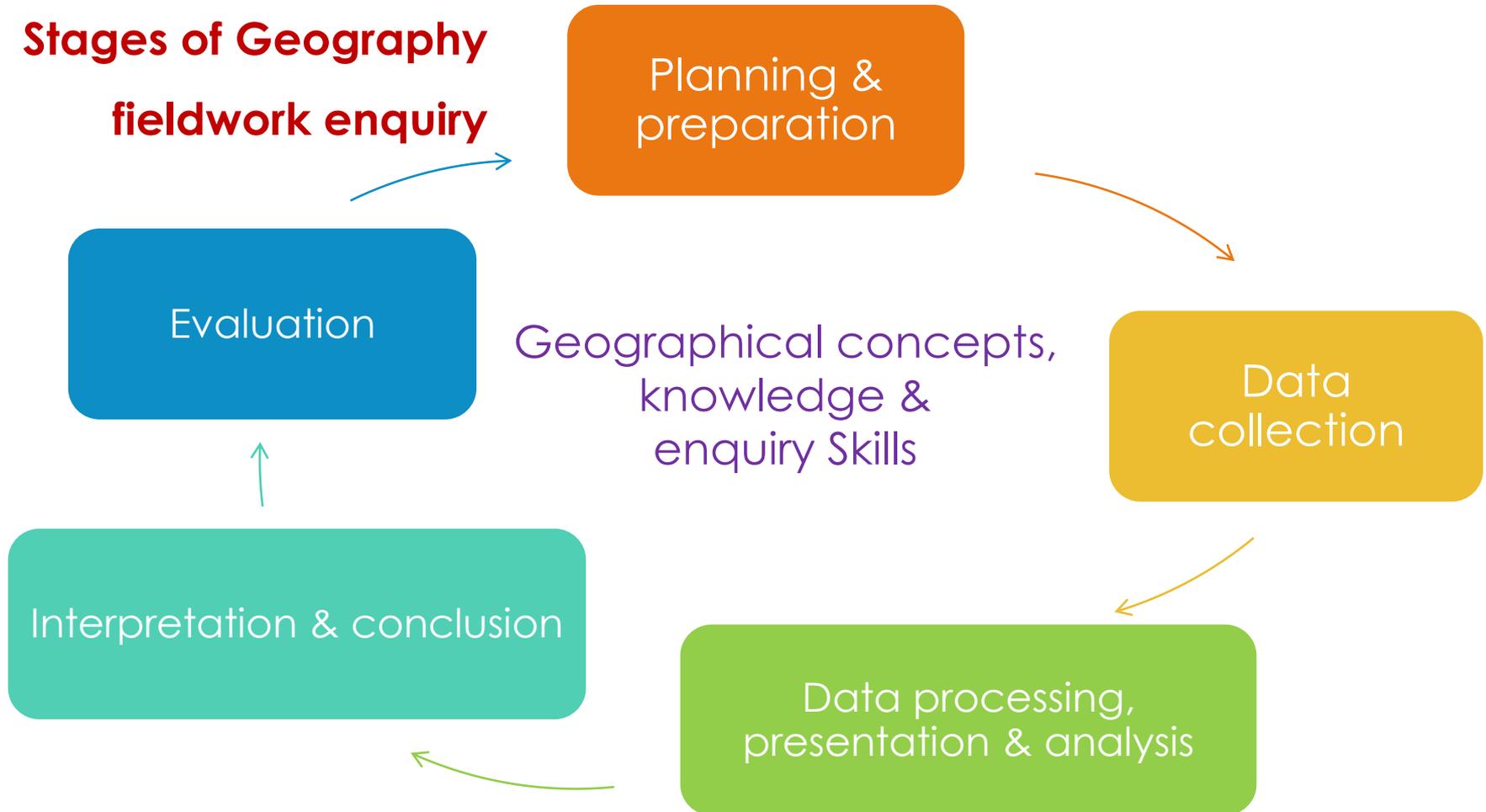
Geographical knowledge of the topic & issues

Planning & preparation – enquiry issues, objectives

(i) Explain why area X is an appropriate field study site for this geographical investigation (urban encroachment). (2020 HKDSE)

Data collection

(a) Describe how to collect the data (distance travelled by floating object along the shore per minute) with different tools and instruments in this field study. (2019 HKDSE)

Data processing

(b) (ii) How should the students process (calculate river discharge) and utilize the data collected before hypothesis testing? (2022 HKDSE)

Evaluation – enquiry issue (urban land use &environmental quality)

(d) Describe and explain how to redesign the data collection method to raise the validity and reliability of the field study (2020 HKDSE)

ASSESSMENT OF FIELDWORK SKILLS (1)

(1) Abilities in fieldwork **planning** & **preparation**

- choose appropriate field study site (2021) and time (2022);

- clarify the objectives of the fieldwork enquiry (2019, 2021, 2022);

- identify relevant issues for hypothesis testing (2019); &

- carry out practical preparations: choice of data collection methods and necessary instruments (2019, 2020)

ASSESSMENT OF FIELDWORK (1) PLANNING & PREPARATION

HKDSE FBQ Questions	Knowledge/ skills assessed
Suggest another field study topic to be carried out in the area. Describe and explain the method(s) of collecting data. (2019 1d)	• Choosing geographical enquiry topic: objectives, relevant issues • Choice of data collection methods and necessary instruments (Reliability & Validity)
What are the merits and demerits of using the 'Urban Environmental Quality Assessment Form' to collect data. (2020 1a)	• Evaluation of tools used (assessment scores) in data collection • Reliability & validity of fieldwork
Account for the merits and demerits of the method of selecting field study sites. (2020 1b)	• *Evaluation of sampling method used in selecting sites • Reliability & validity of fieldwork
Explain why area X is an appropriate field study site for this geographical investigation (2021a i)	• Validity of field study site selected (Objectives of enquiry) • Risk assessment
State one merit and one demerit of the date for conducting the fieldwork. Explain your answer. (2022 a)	• Selection of date: Validity & reliability of field work (Objectives of the enquiry) • Risk assessment

PERFORMANCE IN FIELDWORK (1) PLANNING & PREPARATION

	Able to	Fail to	Other comments
2019 (1d)	-Suggest some general and broad topics e.g. environmental study, impact of urban area -List out some instruments or indicators to collect data	-Suggest specific topics with clear objectives -Describe reliable and valid data collection methods -Choose relevant and appropriate instruments for the fieldwork	-Inappropriate topic (too difficult to carry out) e.g. effectiveness of breakwater in reducing wave energy -collect irrelevant secondary data from newspaper or websites
2020 (1a)	-State some merits & demerits of using the Assessment Form e.g. subjective	-Relate merits & demerits to reliability & validity of data collected -Explain the demerit of 'subjectivity'	Irrelevant answer: e.g. facilitate comparison or interpretation of data
(1b)	-Understand the basic principles of selecting field study sites e.g. sample size, coverage -Name the sampling method	-Comment on the sampling method used with reference to its influence on the validity and reliability of this fieldwork enquiry	-Inadequate understanding of sampling methods: mix up quota, stratified and systematic sampling; no. of samples for each land use must be equal

	Able to	Fail to	Other comments
2021 (1a)	-interpret the information (map) -Understand the basic principles of selecting a field study site: e.g. safety & accessibility	-See the relationship of the geographical setting and the objective of study (validity of fieldwork)	-unsound reasons e.g. 'with different land uses in the area' or 'each type of land use is more average in size' etc.
2022 (1a)	-State the potential risks in conducting fieldwork in rainy season as the demerit	-State the merit -Explain the merit and demerit of the date for conducting fieldwork in terms of the validity and reliability of data collected.	

Improvements:
- Understand the importance of the objectives of the enquiry in fieldwork planning.
- Understand the concepts of reliability & validity of fieldwork enquiry, and take these into consideration in planning (choice of date, place, sampling method etc.)

(2) Abilities in data collection

- use of sampling methods (2021, 2022);

- make observations in the field (2021);

- make use of equipment, tools and instruments for data collection (2019, 2021, 2022);

- record relevant data (2021) &

- collect relevant data and information from secondary sources (2021)

HKDSE FBQ Questions	Knowledge/ skills assessed
Describe how to collect the data with different tools & instruments. (2019 1a)	• Make use of tools & instruments given (ranging poles, measuring tape, stop watch etc.) in data collection
*Describe the procedure from data collection to the production of Figure 1b. (sketch map) (2021 1a ii) (*Data collection, processing & presentation)	• *Make use of sampling method to choose appropriate field study site • Field observation & record data • *Statistical technique: grouping • *Presentation of data: mapping
*Describe how the interviews could be conducted in order to collect the necessary information. (2021 1b) (*Planning & preparation, data collection)	• *Validity & reliability of data: sampling methods, questionnaire design (relevant data), interview methods etc. • Make use of questionnaire to collect data through interview
Describe how to use the tools listed in Table 1a to collect the data of channel depth and width in order to draw the river channel cross-section. (2022 1b i)	• Systematic sampling • Make use of tools & instruments given (ranging poles, measuring tape, ruler) in data collection.

	Able to	Fail to	Other comments
2019 (1a)	-Describe the general uses of tools	-Name the tools correctly -Describe the specific use of the tools in collecting data in this fieldwork	-inadequate understanding of 'longshore drift'
*2021 (1a ii)	-Describe briefly the data collection methods	-*Describe appropriate sampling & data collection method e.g. observation.	-inadequate understanding of the data collection procedure
*(1b)	-Describe the basic data collection method: selecting interviewees, the mode of interviews	-*See the importance of choosing right interviewees and interview questions: validity & reliability	-some candidates misinterpreted the question and listed only a few interviewing questions
2022(1b i)	-Describe the use of instruments in measuring the channel depth and width	-Describe the proper use of the ranging poles.	

Improvement:

- Understand the importance of reliability & validity in data collection procedure: from choosing sites, the sampling size to the ways of collection.

(3) Abilities in **data processing**, **presentation** and **analysis**

- employ appropriate statistical techniques (2019, 2020, 2021, 2022);

- produce charts, sketches, diagrams etc. (2019, 2020, 2021, 2022);

- use IT e.g. GIS for handling data; &

- review and analyze the data (2019, 2020, 2022)

(4) Abilities in making **Interpretation** and **conclusion**

- apply geographical concepts, knowledge and terminology; & interpret the findings of the enquiry (2019) ;

- draw valid conclusions which are supported by evidence and findings (2019, 2020)

HKDSE FBQ Questions	Knowledge/ skills assessed
The students arrived at the conclusion that 'the higher the wave frequency, the slower the longshore drift' in this field study. *Based on the data in Table 1c, discuss whether the above conclusion is appropriate. (2019 1c) (Data processing, presentation & analysis; interpretation & conclusion)	• Employ appropriate statistical techniques: correlation • Handling of extreme data in data processing • *Draw valid conclusions (supported by evidence and findings)
The students composed a field study report with the hypotheses: 'The environmental quality of industrial land use is poorer than that of other land uses'. *Describe how to process and utilize the data collected to complete the field study report. (2020 1 c) (*Data processing, presentation & analysis; Interpretation & conclusion)	• Employ appropriate statistical techniques: grouping of data , mean • Produce graphs/ charts • Analyze the data through interpretation of graphs/ charts or comparison etc. • *Hypothesis testing • *Draw valid conclusions from the findings

HKDSE FBQ Questions	Knowledge/ skills assessed
*Describe the procedure from data collection to the production of Figure 1b. (sketch map) (2021 1a ii) (*Data collection, processing & presentation)	• *Make use of sampling method to choose appropriate field study site • *Field observation & record data • Statistical technique: grouping • Presentation of data: mapping
The students compiled a fieldwork report with the hypothesis: 'River discharge increases downstream'. How should the students process and utilize the data collected before hypothesis testing? (2022 1c)	• Application of knowledge of river channel to find out the cross-sectional area & discharge • Statistical techniques: e.g. mean • Presentation & analysis: produce charts/ diagrams for hypothesis testing

PERFORMANCE IN (3) DATA PROCESSING, PRESENTATION & ANALYSIS (4) INTERPRETATION & CONCLUSION

	Able to	Fail to	Other comments
2019 (1c)	-Process the data e.g. calculation of the mean -(Some) exclude the extreme data in analysis	-(Some) process & analyse the processed data	-(Some) respond like answering data based questions: describing & explaining the differences in data sets
2020 (1c)		-Describe the processing procedure e.g. grouping & summarizing & utilization of data -Employ appropriate statistical techniques: e.g. grouping, summarizing data -express their ideas precisely & systematically	Misinterpret the question: (1) work on the data (calculated the mean scores) to test the hypothesis; (2) describe the data collection processes
2021 (1a ii)	-Describe the procedure of mapping: division of the area into grids, categorisation of land uses and assigning codes.		

	Able to	Fail to	Other comments
2022 (1c)		-Describe the data processing procedure systematically & clearly. -Apply the knowledge of river channel in the calculation of river discharge. -Employ appropriate statistical techniques e.g. calculation of 'mean' value of the data. -Describe how to utilise the data processed to test the hypothesis.	-Not responding to the question: describing the drawbacks of data collection methods or the problems of using extreme data.

Improvement:
- Describe the procedure systematically & express ideas clearly.
- Apply appropriate statistical techniques in processing data.
- Use graphic presentation to help analyze the data e.g. the correlation of two variables etc.
- Make use of the processed data to draw valid conclusions.

(5) Abilities in **evaluation** of fieldwork

- evaluate the methods of investigation used (2019, 2020, 2022);

- suggest any possible alternative approaches to the methods and skills used (2021); &

- suggest extensions and improvements for future investigation (2022)

HKDSE FBQ Questions	Knowledge/ skills assessed
Suggest the drawbacks of the above method of data collection. Explain how such drawbacks affect data reliability. (2019 1b)	• Evaluate the method of data collection - sampling size, site selection etc. • Reliability of fieldwork
Describe and explain how to redesign the data collection method to raise the validity and reliability of the field study. (2020 1d)	• Evaluate data collection method • Suggest improvements in design • Reliability & validity of field study
The students found that the data collected was inadequate to test the hypothesis 'The size of abandoned farmland increases with urban encroachment'. *How can the collection of secondary data help test this hypothesis? (2021 1c) (*Data collection, processing, presentation, analysis, interpretation & conclusion)	• Objectives of enquiry, limitations of primary data & alternatives • *Data collection from secondary sources: validity & reliability of data • *Processing of data: mapping, GIS, calculation etc. • *Hypothesis testing: comparison
Evaluate the data collection methods used in this fieldwork and suggest ways for further improvement. (2022 c)	• Evaluation of the data collection methods: sampling, sites selection, instruments used etc. • Suggest improvements • Reliability & validity of field work

	Able to	Fail to	Other comments
2019 (1b)	-Suggest some general drawbacks of data collection method	-Understand the meaning of 'data reliability' -Explain how the drawbacks affect the 'reliability' of data	-Recitation of irrelevant drawbacks e.g. subjective, improper use of tools etc. -Give irrelevant answers e.g. reasons for getting extreme data
2020 (1d)	-Base on the demerits in (a) and (b), suggest some fragmented and piecemeal modifications of the data collection method (usually general), e.g. increasing the size of the samples, improving the scale of scoring of the assessment form etc.	-Give a comprehensive re-design that is broad in both coverage and perspective -understand 'validity' and 'reliability' of a field study. -Explain how these modifications might improve the 'validity' and 'reliability'.	-(Some) describe and explain the procedures of using different instruments in field (similar & irrelevant) -(Some) suggest to collect secondary data from government department etc. (irrelevant)

PERFORMANCE IN (5) EVALUATION (CONT')

	Able to	Fail to	Other comments
2021 (1c)	-List the sources of some common secondary data, e.g. the internet, government departments and newspapers, etc.	-Realise the land uses involved in this study would be changing with time -Select relevant secondary data. -Elaborate on the processing of the secondary data & the utilization of both processed primary & secondary data in hypothesis testing	
2022 (1c)	-State briefly some general drawbacks of data collection, such as inadequate number of sites and records -Suggest brief and general ways of improvement, e.g. choosing more sites or taking more records etc.	-Explain further with reference to validity & reliability -Evaluate the data collection methods comprehensively -Comment on the sampling methods used and the appropriateness of sites chosen.	

Improvement:
- Do not rely on recitation as the major means of learning.
- Apply knowledge to different situations (topics, objectives etc.).
- Understand the concepts of 'reliability' & 'validity' of fieldwork.

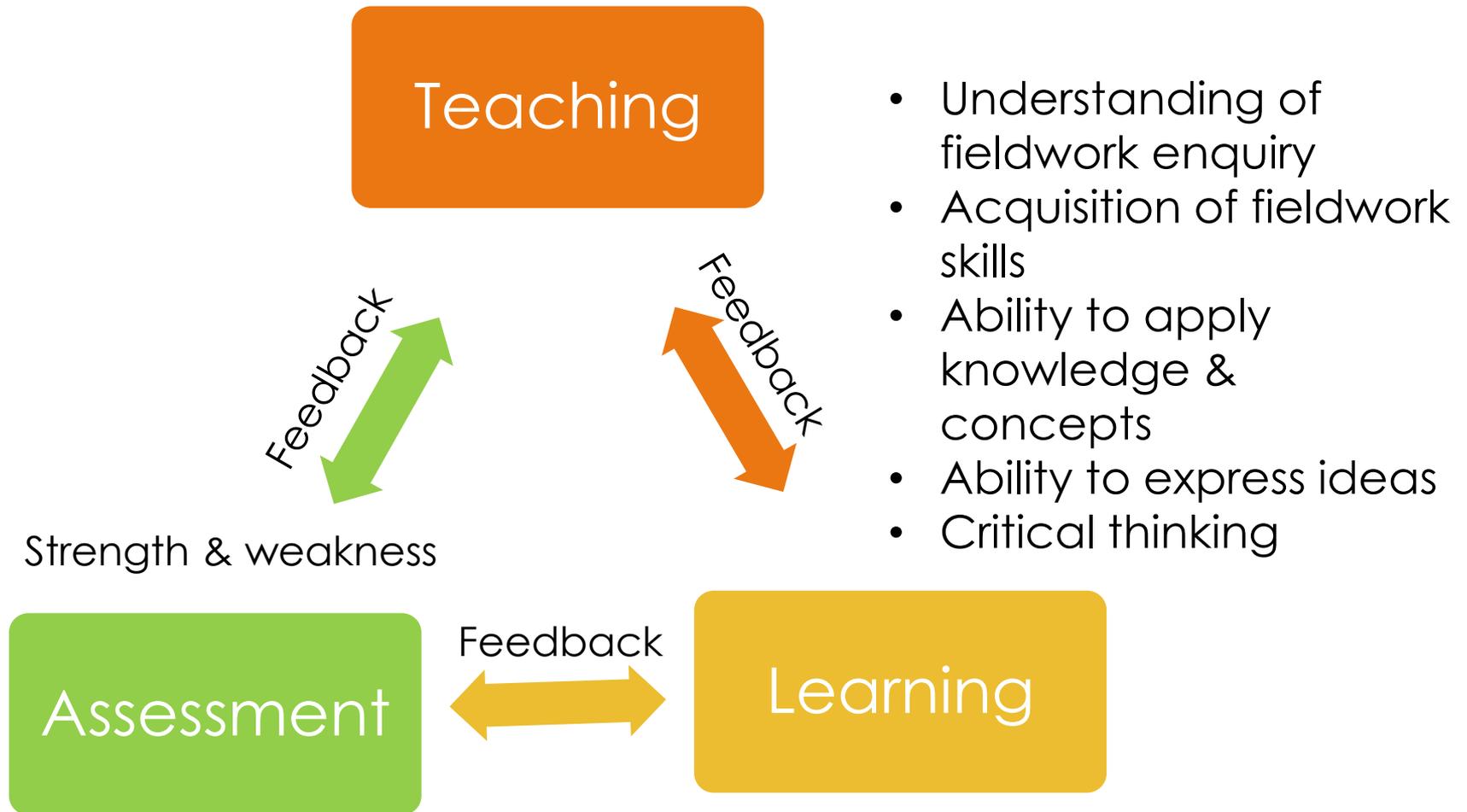# STRENGTH & WEAKNESS

- Demonstrate basic knowledge and understanding of fieldwork enquiry
- Able to interpret information e.g. maps
- Perform better in straightforward questions e.g. merits & demerits

- Memorization and recitation

- Surface learning:
  -brief, general and superficial answers;
  -weak in explanation & elaboration

  Inadequate understanding

- Poor in application: unable to refer to the specific situation provided

- Inadequate understanding of the meaning in a fieldwork enquiry:
  -particularly weak in the concept of 'reliability' & 'validity' of fieldwork study
  -relevance to the objectives of the study

- Weak in describing the procedures involved in fieldwork e.g. data processing, analysis etc.
  -limited by their abilities to express
  -inadequate understanding of statistical techniques
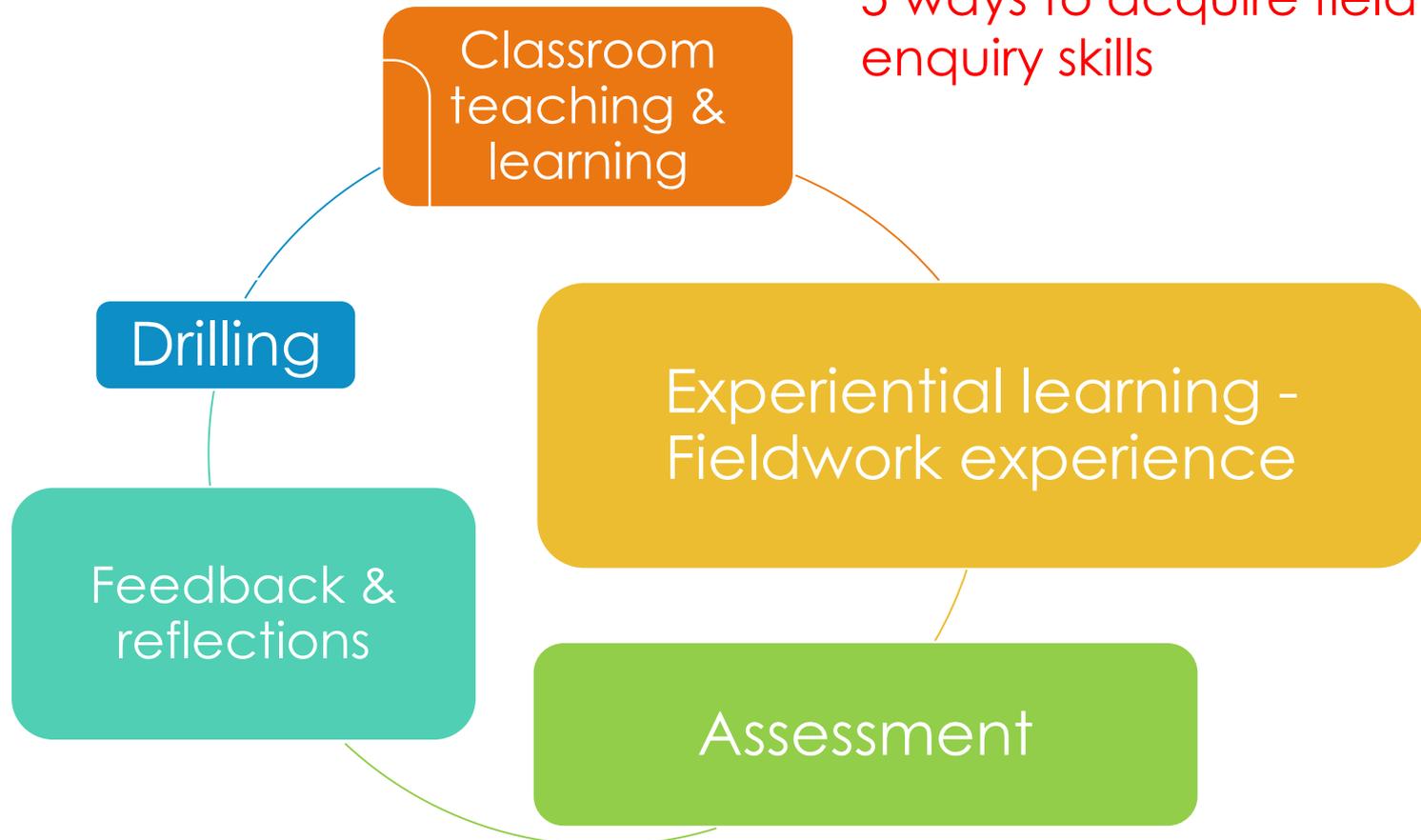 -unable to process & analysis data independently (i.e. without fieldwork instructions)

HOW TO EQUIP STUDENTS FOR HKDSE FBQ?

Teaching

Feedback

Feedback

Strength & weakness

Assessment

Feedback

Learning

- Understanding of fieldwork enquiry
- Acquisition of fieldwork skills
- Ability to apply knowledge & concepts
- Ability to express ideas
- Critical thinking

HOW TO DEVELOP STUDENTS' UNDERSTANDING OF FIELDWORK ENQUIRY?

5 ways to acquire fieldwork enquiry skills

Classroom teaching & learning

Drilling

Feedback & reflections

Experiential learning - Fieldwork experience

Assessment

HOW TO DEVELOP STUDENTS' UNDERSTANDING OF FIELDWORK ENQUIRY?

(1) Classroom teaching and learning:
- Knowledge and understanding of principles, concepts etc. in fieldwork enquiry
- Technical skills: statistical techniques, presentation etc.

Effectiveness depends on the teaching strategies adopted

- Enquiry-based learning approach?

- Active learners (deep understanding) vs Passive learners (surface learning)

- Opportunities to ask questions, discuss etc. – thinking & understanding

- Opportunities to apply knowledge & skills

(2) Experiential learning - Fieldwork

-learning by doing
-connect knowledge & skills learnt in the classroom to real world

Guided tour

Enquiry fieldwork

Field learning activities

Field excursions
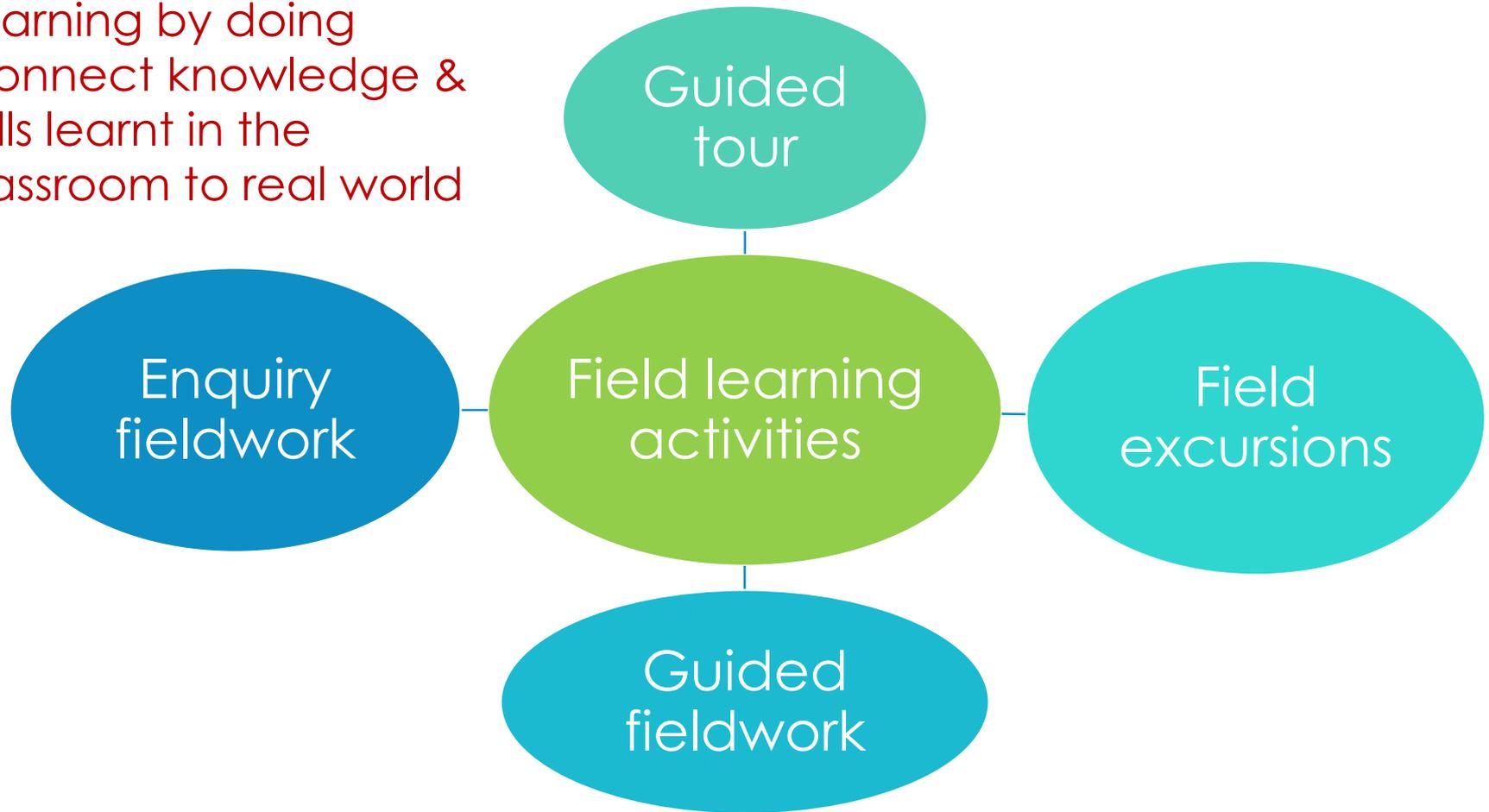
Guided fieldwork

FIELDWORK- A MODE OF 'LEARNING TO LEARN'?

Guided tour & field excursions

- Aim: to gain knowledge and enhance understanding of issues, concepts

- An opportunity to learn about a place or feature & apply knowledge to the real world

- Teacher dominates most of the talking (explaining & questioning)

- Students concentrate solely on listening, observing, answering, note-taking, photo-taking, and completing worksheet's tasks etc.

Enquiry skills learnt?

Guided fieldwork

- Teacher centered: selected enquiry topic, site, time etc.

- well designed fieldwork manual prepared by teacher, with clear instructions

- Students follow the instructions and apply knowledge and (specified) practical skills
  -using instruments to collect data & record;
  -drawing charts/ graphs; &
  -hypothesis testing and drawing conclusion

HOW TO MAKE THE MOST OF A FIELDWORK?

Enquiry fieldwork

Student-centered

Thinking skills & application of knowledge

(1) Identify a geographical issue or problem

Geographical enquiry skills, technical skills e.g. land use mapping, statistical techniques
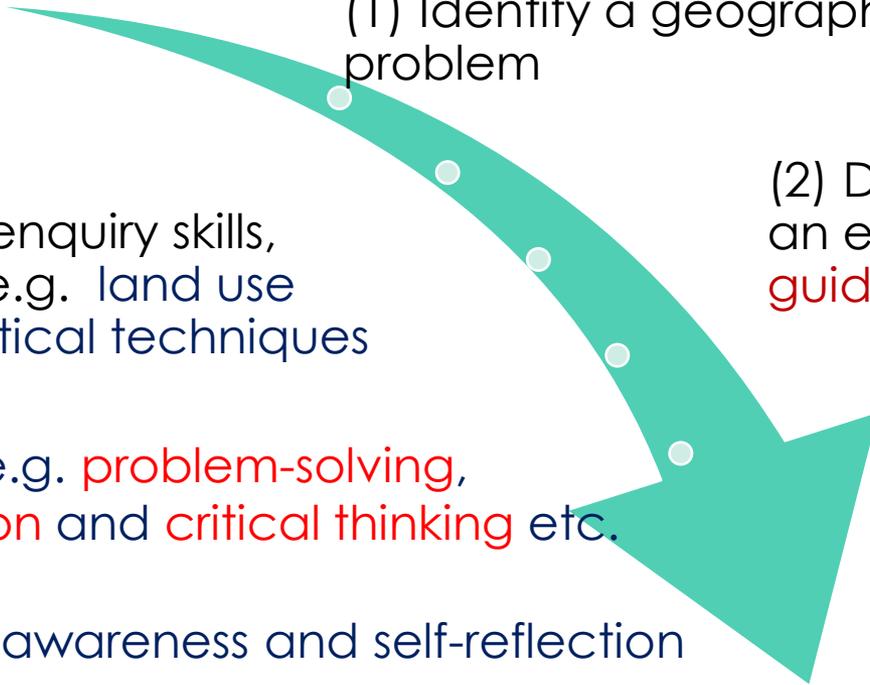
(2) Design and carry out an enquiry study with the guidance of teacher

Generic skills e.g. problem-solving, communication and critical thinking etc.

Self-awareness and self-reflection

Deep understanding

(1) Planning and preparation stage

- What is the purpose of fieldwork enquiry?
  -topic, aims, objectives etc.

- What are the geographical theories, concepts, issues or ideas that formed the basis of fieldwork investigation?
  -Setting of hypothesis

- Why is the site/ location/ time chosen appropriate for fieldwork enquiry?
  -geographical setting and characteristic features of the study area
  -relevance to the fieldwork topic, validity (related to the aim of investigation), advantages, risk assessment etc.

- How to minimize risks associated with data collection?
  -measures

(2) Data collection

- **What kind of primary data to be collected? Why?**
  -primary sources of data, aim & objectives of investigation, validity & reliability of data

- **How to obtain? Why is it appropriate?**
  -methodology, use of equipment and instruments, relevance to the study, strength and weakness, alternatives, justification

- **What sampling techniques? Why?**
  -merits and demerits, amount of time and resources, influence on reliability & validity

- **How to obtain and why to use secondary data in enquiry?**
  -relevance, reliability, validity, justification

(3) Data processing, presentation and analysis

- What methods and why?
  -data transformation process, statistical techniques
  -merits and demerits, alternatives, justification

(4) Interpretation and conclusion

- How to interpret the findings related to the fieldwork topic?
  -application of geographical concepts and knowledge

- How to summarise and draw valid conclusions?
  -hypothesis testing supported by evidence and findings

Evaluation

- What are the merits and demerits of the methodology used? How to improve?

  -critical evaluation

  -suggestions for improvements

- Any further areas of research?

  -extensions for future investigation

HOW TO INCREASE FIELDWORK EXPERIENCE OF STUDENTS?

- Starting from S1 - 3: progressively from guided enquiry fieldwork to more open enquiry fieldwork

- small-scale project

- conducted near the school (neighbourhood), within school premises (e.g. survey & questionnaires)

- E.g. traffic/ pedestrian count, living environmental quality survey, urban land use survey, slope survey etc.

- Advantages: low cost, low risk, easily managed, completed within a short period of time, low stakes assessment.
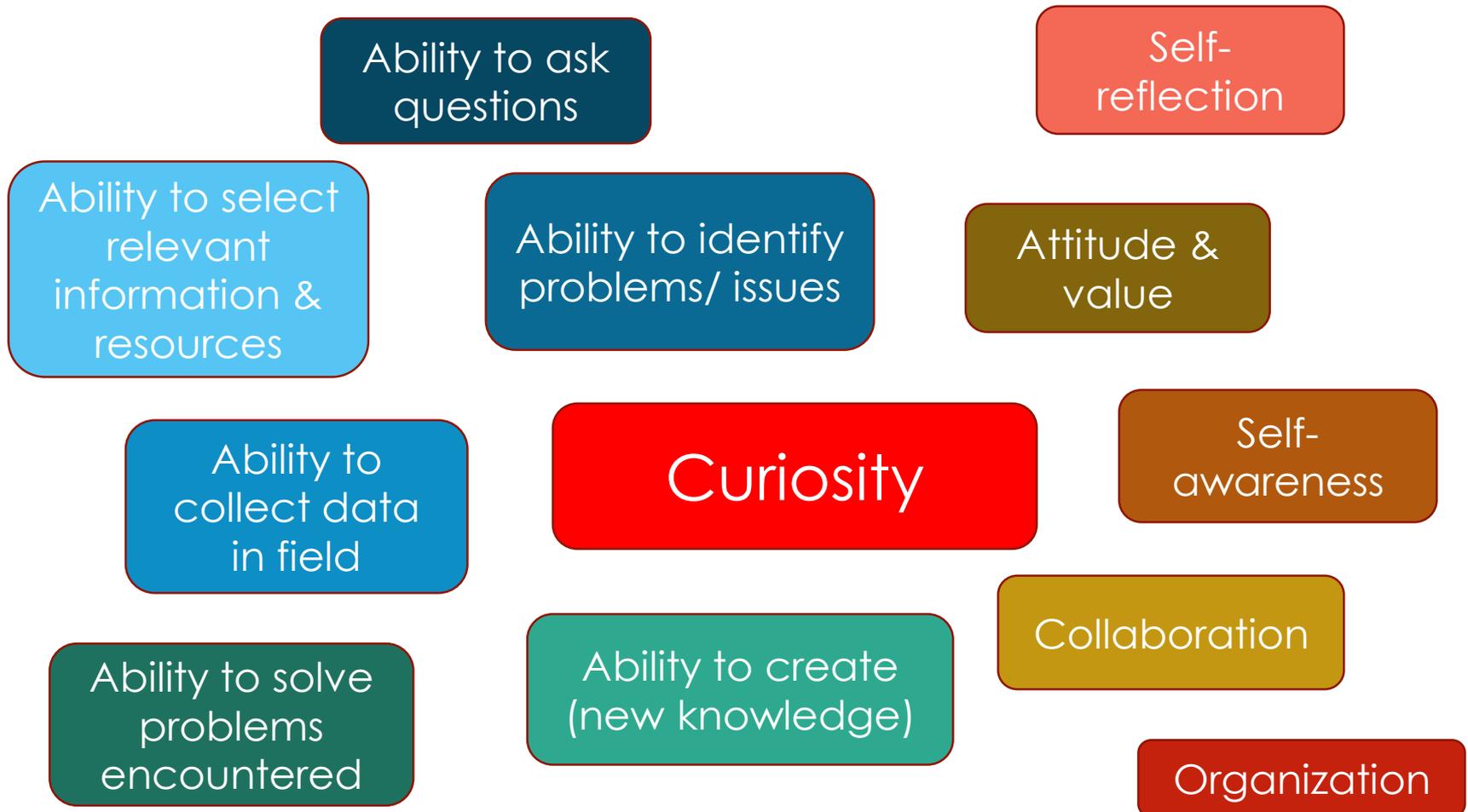
More = better ?

Assessment, feedback & reflections

(3) Assessment

- Assessment = Written tests or Examinations?

- Summative "Assessment of learning" or Formative "Assessment for learning"

- Diagnostic & developmental: Feedback on students' performance, progress, awareness of their strength & weakness, and ways to improve

- Continuous & diversified assessment: field observation, oral report & presentation, written tasks e.g. fieldwork proposal plan, fieldwork report……etc.

(4) Feedback & reflections

(5) Drilling

THE WAY FORWARD?

21st century assessment method(s) for 21st century learning skills?

Ability to ask questions

Self-reflection

Ability to select relevant information & resources

Ability to identify problems/ issues

Attitude & value

Ability to collect data in field

Curiosity

Self-awareness

Ability to solve problems encountered

Ability to create (new knowledge)

Collaboration

Organization

THANK YOU