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[Quiz 1] Introduction to Academic Writing

Please answer the following questions:

1. Please list **(at least) eight** skills facilitating research.

   analytic mind, intelligence, curiosity, commitment, interest, mathematics, programming, literature search, experience and so on.

2. How would you like to explore a new field? Please list **(at least) three tips/methods.**

   Firstly, check the requirements from books and articles, such as top journals, most-cited article and online databases.

   Secondly, choose a topic. We usually choose a broad field of research and a familiar field is a good idea.

   Thirdly, narrow down the topic and find topics not many have researched.

   Finally, define a practical issue or theoretical problem or both of them to begin research.

3. Please list **(at least) four** online databases for research.

   Web of Science, IEEE Xplore, ScienceDirect, Arxiv, China National Knowledge Infrastructure and so on.

4. Please share **an example (not from the slides)** of finding a research niche.

   Example: Is post-selection of weak measurement harmful to measurement?

   Some scholars pointed out that a large amount of signal power is discarded in the weak value amplification because the post-selection is close to the orthogonal state with the pre-selection, which is very unfavorable to the detector with lower sensitivity.

   Some scholars use Fisher information to analyze and explain that the post-selection retain the information needed for the measurement. Other scholars used the joint weak measurement method to improve the weak measurement so that it would not discard the information in the post-selection process.

5. What's your opinion on the difference between practical issues and theoretical problems? (in 200 words)

   Practical issues focus on the improvement or application of exist theories or methods. Take weak measurement as an example, we can use bias weak

measurement and joint weak measurement to improve weak measurement, or use weak measurement to make it suitable for more parameter measurements.

Theoretical Problems aim at expanding knowledge in a unknown field or a unsolved troubling question, such as the debate on the particle nature and wave nature of light and whether the quantum mechanical description of physical reality can be considered complete.