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How to write report

--- Комментарий: формулируем кратко не больше трех предложений на заголовок и текст ---

Тэги: С учетом контекста как можно использовать эту идею

Текст - содержательная часть (что за мысль\ идея и откуда пришла в голову)

Paraphrased

Original

Introduction

Since the abstract is relatively concise, and many readers who aren’t familiar with the field might not fully understand it, it is useful to begin with an elaborative introduction. Beginning with the information that you suspect readers would already know is considered a good start. Dwelling upon it, you should subsequently lead readers to your investigation and explain what you aim to obtain from the experiment. It would be correct to say that while the abstract addresses the experts of the field, the introduction aims to explain the experiments to all the scientists who have some basic understanding of the subject and are interested in expounding it further.

Theory

There are several types of experiments. Some of them aim to investigate a new phenomenon or employ a new technique to produce results, while others aim only to recreate previous results to understand the process of scientific inquiry. The theory in the report depends on in which category your experiment lies. If you are only reproducing an already done experiment, without any significant alterations in the method, then it is more likely that the theory is quite well-known. It is not necessary to rewrite it on several pages. You can discuss the

details briefly and give references in the end for interested readers to delve deeper on their own. In these cases, students should avoid reproducing text and figures from the laboratory manuals.

If, on the other hand, you are stepping into the unknown territory and researching relatively newer ideas, you would need to study its theory more rigorously and include a detailed theory-section in the report. Even in this case, stay focused. Don't forget the purview of your experiment and only include theoretical details that are relevant.

For example, if there are any subtopics that you think readers will enjoy exploring, briefly allude at them and add references for the readers to do their homework. You want your readers to be active engagers who are not spoon-fed everything. This technique is quite prevalent in formally published scientific papers that have passed through rigorous peer-review. As researchers can't discuss the vast number of topics relevant to the research, they only introduce them with appropriate and up-to-date references.

Experiment

In this section, you need to explain the set-up for the experiment and the procedure used. At times, performing the experiment is the most time-consuming part of the entire process, but you do not necessarily need to describe all the technical details in the report. Again, it would be best to record them in your journal, but not in the report. If you are using complex equipment or an uncommon, homegrown device, it is recommended to explain its functionality in context with your experiment.

In the experiment section of the report, there is one crucial thing that several students fail to understand. A report is different from a manual for the experiment. While the manual is the complete how-to guide to perform the experiment, the report mainly emphasizes on analyzing results and deducing conclusions. Thus, don't include step-by-step details of the procedure and the lists of apparatus and equipment used. Instead, briefly touch upon the method of the experiment in a paragraph or two. The apparatus you use must also be seamlessly integrated into these paragraphs. Students should avoid redundant explanations for each step in the process, unless necessary.

You can also choose to include photographs of your experimental set-up as key sub-assembly – a clever trick that adds value to your experiment.

Results

As it is the results of the experiment that ultimately determine the potency of the hypothesis, this section holds eminent significance. Undoubtedly, the validity of the results is what matters the most. But at the same time, the representation of results also plays an equally vital role in gaining recognition from the scientific community. For example, many experiments deal with large datasets and several graphs that need to be interpreted to obtain results. As an adept scientific inquirer, you should explain the data and graphs in simple words and relate it to the theory. However, sometimes, it is tough for readers to actually see your claims through the data coming. This is where the representation of results can make a significant difference. By making the datasets and graphs palatable to the reader, you can save everyone's time and keep them engaged in your study.

There is a considerable variation on how results are represented in different reports, and they depend on the type of experiment. If your results are mostly numerical, it is better to display them in a table or a graph. A useful tip in this regard would be to look at your results and ask yourself, "would your report look more organized and results more comprehensible if you represent them in tabular form?" If so, tabulate them. Or "would a graph work better and what kind?"

Discussion

Discussion is certainly the most crucial part of the report. Here the results are interpreted, and the initial questions raised in the report are answered. For some students, it is also the most complicated part of the experiment. It is clearly the section that requires a nudge to our scientific intuition and 'wisdom' of physics. But binding the experiment with its true meaning and placing it in the bigger scheme of physics is of foremost importance. This should really be the most interesting part of the lab report. Unfortunately, many a time, it is found to be quite mechanical and boring as many students exhaust their patience when they have reached the final hit (or the deadline for submission is looming around the corner).

This usually happens when students only follow the guidelines of the experiment manual without having a proper understanding of the objectives and theory of the investigation. One would find it tough to comment on

whether the goals of the experiment have been achieved if they don't know them in the first place. Such students usually end up making facile deductions that make the report assailable. Thus, before performing the experiment, study its theory thoroughly to understand what is it all about. Sometimes it is nice to appreciate even the historical place of the experiment.

The upshot is that in the Discussion, you should interpret your results and comment on noise and uncertainties too. You can also discuss the limitations, if any, in your procedure that might have hindered the process. Lastly, you can talk about any additional factors that you didn't count for during the experiment but could have influenced your results. If you were given a second chance, what different would you do?

Conclusion

Adding a conclusion to your report is not always essential. If you have any culminating remarks that you think could summarize the experiment, you can include a conclusion. Some students restate the abstract with more technical details, as readers are more likely to understand them now. This is also a useful strategy. Lastly, it is always useful to tell the readers what you could not achieve. This sheds light on what you have achieved. Clever part!

References

Many students mistakenly think that references are not mandatory for a full-fledged report. As discussed earlier, it is not convenient to discuss all the subtopics regarding the experiment in the report. But to ensure that readers are not lost in the jungle of the web to find relevant information, references are the key. For theory, in particular, cite the information that is taken from a book, journal, or any online platform. It is also essential to avoid plagiarism.

So far, we have seen how a lab report is normally arranged. We now discuss some essential ingredients. A lab report in physics comprises of four major constituents: text, mathematical content, tables, and figures. We will discuss each of them individually and provide you with tips and tricks to improve the outcome.

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Text in the Report**

In textual narratives, it is important to implement the technicalities of writing correctly. The following are some points where students are found to make mistakes.

1. Many students begin their reports quite thoughtfully. They study and verify each detail before adding it to their report. But after a few paragraphs, this rigor begins to compromise. They add superfluous details that bring no value to their research. To avoid this, before introducing any new idea into your report, **ask yourself if the information is really relevant**. In any scientific inquiry, quality matters over quantity, and brevity is the soul wit.
2. Simple yet convincing writing is not everyone's forte. Many people associate convoluted and lengthy sentences with good writing. For a scientific report, it is not the case. It is always recommended to **compose concise and meaningful sentences**. If you are writing about a complex piece of information, it is advised to break it down into shorter, succinct, and clearer sentences.
3. Many students struggle with the consistency of the tense in the report. If you are **currently** writing the report, that means you've performed the experiment in the **past,** and your supervisor will read it in the **future**. So, which is the best tense to choose?
   Work was done and the observations made can be written in the past tense. For example, 'On increasing the voltage, the temperature of the resistor increased' Whereas, general truths such as 'smoking increases the risk of cancer' and atemporal facts such as 'the paper represents the side effects of smoking' can be written in the present tense. Lastly, if you want to discuss any prospects for the research, you can opt for the future tense. For example, 'in the follow-up experiment, we will explore the effects of air quality.'
4. For a more complicated sentence, you might have to use more than one tenses in the sentence. For example, 'In 1905, Einstein postulated that the speed of light is ' [1]
5. For any formal writing, including a report, it is ideal to write **in the third person**. Writing in first is considered informal, whereas writing in the second person for a report makes no sense. The second person (you, yours, etc.) is common in a manual or an instructional note, such as the one you're reading.
6. **Emphasize on the verb of the clause** as it adds strength to the sentence.

Not preferred

Preferred

The increase in temperature produced a significant increase in the rate of reaction.

The increase in temperature increased the rate of reaction.

The results show a comparison between catalyst A and catalyst B.

The results compare catalyst A and catalyst B.

An analysis can be performed on both the specimens.

Both the specimens were analyzed.

No oscillations were observed in the pendulum.

The pendulum did not oscillate

7. **Do not use ambiguous and evasive language**. For example, a sentence like 'it is believed that the concentration of reactants affects the rate of reaction' is incompetent and vague. It is unclear whose beliefs we are talking about. Instead, it should be written as 'chemists believe…', 'we believe…', etc.
8. The report should appear like a **logically consistent and unified thematic journey** through the experiment. It shouldn't feel like a hop-on, hop-off route in a labyrinth.
9. Be consistent in capitalization. **Avoid excessive capitalization**: "*the cathode*" instead of "*the Cathode*" should be preferred. Only the pioneers in the field have the liberty of using this stately language.
10. Avoid starting sentences with "and", "now", "also", "then", with symbols and numerals (1,2,565, -3, E, Vi), or any abbreviations.
11. In LaTeX, mathematical expressions or equations can be written in math mode by writing between the dollar signs — $ … $. For example, "The voltage is increased to 4 volts".
12. **Be careful while writing units and symbols in text.**

Комментарий

Референсы

- Откуда взята цитата или идея?
- Как эта идея дополняет то, что Я уже знаю?
- можно ли объяснить это по другому с помощью того, что уже есть
- как этот X повлияет на Y?
- Как Я могу при помощи этой идея объяснить Z?
- Связь между заметками ДВУХСТОРОННЯЯ, найти записи близкие по контексту