A PROFESSIONAL LOOK AT LAB REPORTS

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Sent email 4/29 requested previous submissions/my notes for comparison.

Lab reports are often held to a common professional level of standard in terms of what they entail with the common structure being shared across the disciplines. The sections of a lab report consist of parts like a title, references, abstract, introduction, results and conclusion. Three sample reports that I have chosen are the *Color Rendering Properties of LED Light Sources from Rensselaer Polytechnic Institute*, *Impact of particle shape on electron transport and lifetime in zinc oxide nanorod-based dye-sensitized solar cells from CUNY City College,* and *Final Report: A fluidic Dump Combustor for Ramjet Engines* from SUNY Buffalo. Despite having near identical structure, each of the lab reports gain a unique identity and ultimately lead to variations of effectiveness, strengthening the claims made in the paper.

Color Rendering Properties of LED Light Sources from Rensselaer Polytechnic Institute(RPI) is a report written to address an earlier assumption of human subject responses which assumed color preference to be a measurement of color rendering. The purpose of this report was to test the color rendering property versus the color preference aspects of LEDs and check weather or not CRI is a good metric for color preference. psychophysical Survey data collected by RPI showed that lower CRI(Color Rendering Index) light source were actually more preferred than light from high CRI halogen/Incandescents. The report used the survey data to conclude that CRI has no correlation to people's' color preference and that a better metric is needed to quantify light source color rendering and preference properties.

The lab report titled *Impact of particle shape on electron transport and lifetime in zinc oxide nanorod-based dye-sensitized solar cells* from CUNY City College was written to bring into awareness how particle shape may impact solar cells. This lab tackled this by trying to indicate that the ratio between τ_d/τ_n (electron transport (τ_d) and electron lifetime (τ_n)) can be decoupled by different variables to create greater solar efficiency. Through measuring properties of synthesized ZnO products (SG-NR3 and SG-NP) and using techniques like electron microscopy and x-ray diffraction, the report came to the conclusion that nanoparticle shape is a parameter that affects electron dynamics. Results showed that

electrons had exited the working electrode of SG-NR3 more rapidly than that of the Strem-NP DSC. In conclusion, the study also concluded that nanoparticle shape is actually a parameter that affects electron dynamics in ZnO DSC electrodes.

Final Report: A fluidic Dump Combustor for Ramjet Engines from SUNY Buffalo is a lab report about the combustion systems regarding flame holders. The report was written to test the flame stabilization of two different types of flame holders: the bluff body and the fluidic. Both flame holders were inspected with regards to their rotation, instant vorticity, and turbulent vertical velocity. The fluidic flame holder had an overall more chaotic flame structure which allowed for the more efficient use of the combustion whereas, the more controlled flame structure did not. This advantage by the fluidc flameholder was attributed to the baroclinic torque, and overall the study agreed towards the consensus that the fluidic flameholder was more efficient when compared to its bluff body counterpart in all aspects.

The Abstract is the entry point for most lab reports where a brief overview of what is being discussed is told. All three articles used jargon effectively. Often times, each of the reports would define some terms that seemed more complex, however, overall, an understanding of the field was to be expected by the reader from the very start. With vocabulary like CRI, vorticity, and DSCs, complex terminology used benefited the audience to deepen trust and understanding in what is being discussed. Using professional language in their respective fields established a level of professionalism in the reports to which the audience could resonate easier with to digest information. The main job of an abstract is to give an overview and through the use of jargon the level of depth to the field as well as type of field can be gauged from the very start.

How have you made this determination?

according to whom?

The introduction section of the lab reports was used accordingly to introduce the problems of the reports. Though all three reports established a basis for creating an importance, the article on flame holders did it best. "*Fig 1 Chemiluminescence of mean flame and schematic of the fluidic flame holder flow features*" is a pictorial representation of what the introduction discussed. Being a report scoped

towards engineers, concepts were at first hard to grasp like Chemiluminescence. The pictorial representation of chemiluminescence however allows to better understand what is being discussed to formulate my own understanding with the labeling of parts and visual depiction. Unlike this, the articles on CRI and ZnO had no figures in the introduction. This made it harder to visualize and understand communicated ideas like Architectural lighting and electron mobility. Where complex language may detract from understanding, a better grasp of the concepts is attained of the article through the figure, thus making the introduction of the flameholder report most effective.

The experimental section of each report followed their introductions accordingly. While the article on CRI compared low CRI values to high CRI values in halogen/incandescents and the article on flamerholders tested efficiency between the fluidic flame holder versus the bluff body, the article on ZnO conducted its tests with no regard to one other exact variable: ZnO was compared to three different variables. Three variables being tested at once (SG-NR3, SG-NP, and Strem-NP) made it hard to understand what the study was regarding to in its findings later on. *Figure 3 (A) Intensity modulated photocurrent spectroscopy* had three graphs for each of the tested variables however this larger array of information made it difficult to draw a specific conclusion from them. The experimental setup created three sets of data making it hard to compare and draw conclusions for efficiency directly from two sets of data. Having three variables created an abundance of data whereas the other two lab reports just focusing on two variables specifically was easier to understand and as a result was more effective.

The result section of the lab reports presented their data in general, yet there were some minor differences. All of the reports utilized graphs to visualize numerical data and display overall trends. Displaying a graph helped each of these labs as they were able to display a trend visually to their respective audiences. The result section then expanded on what the data had shown to describe what the implications and meanings of the data were regarding each of their respective content. Unlike the two other labs however, the lab regarding flame holders combined the discussion section with the results

section. Titled " Research and discussion", this 16 page section of the report on flameholder was the bulk of the report. This broad title for 16 pages of writing created a longer section in all as the content was combined from research and discussion into one and made the content feel somewhat overwhelming while reading. The report on flamholders lacked organization with the use of the combined section making the whole read of 16 pages difficult to differentiate between research and discussion.

For the two labs that had a separate discussion section, being the reports on ZnO and CRI, both discussed the results section and the applications it brings to their field of study. The report of CRI utilized data from the results section and went onto explaining it accordingly. The report on ZnO, however, used a graph titled *"electron lifetimes"(figure 4)* to graphically discuss their findings within the discussion section. Implementing a graph is ineffective as new data is brought up in a section which is supposed to explain results from previous data. By adding new data in a section where data is supposed to be discussed, the reader may become confused by the organization of the sections. If figure 4 were moved to the data section, the results of electron lifetimes could be discussed more accordingly thus improving the organization and hopefully the understanding of the report.

The conclusions of each report hoped to close their overall paper. The lab report on flame holders proved why fluidic bases were more efficient, CRIs established that CRI was not a good measure of lighting preference in their study, and the solar research on ZnO showed that it was not yet ready to be used to its full efficiency. Not all of the labs had a sound ending to their report. The ZnO study concluded that Nanorods of ~3:1 aspect ratio do not allow the the electron to be decoupled from combination, however, if the ratio was increased and porosity increased, "electrons could take advantage of the higher electron mobility in ZnO." Although the ZnO study showed that the ratio could not be decoupled at a certain ratio, they bring up that it may in a higher ratio. This leaves room for the question of what happens at that ratio. On the contrary, the other two labs build up to an ending. This is a significant difference as it correlates to again each of their respective purposes and what the lab was intending to accomplish.

While the studies on CRI related to LEDs and flame holders sought to report about a clear answer in their abstracts, the report on ZnO solar cells was more abstract and open. Based on the structure and content in each of the reports, they accomplish what they had: CRI came to the conclusion that CRI is not a good indication for lighting preference, flame holders explained why the fluidic base was better more efficient than the bluff body, and ZnO explored the idea of ZnO as a new solar material. Unlike the other two reports, the ZnO solar report ended with an open conclusion as it was a new study into something not as well known. The ZnO report's open conclusion created an unfinished conclusion that felt incomplete as the study did not fully complete its research. The conclusion of the CRI and flameholder Report both completed their findings and looped back to what the introduction had set out to tackle. Through reading these lab reports, it can be understood that even in common subject areas, there can be great differences in the structure and organization of information based off the intended purpose of each report.

Again, you have made Surface changes but you have not continued to analyze/ answer the analytical questions posed on your previous version.

No Change in grade

References

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You still haven't clearly identified your shorthand for referencing each article, leaving your reader to go back to earlier pages to know which report you mean.